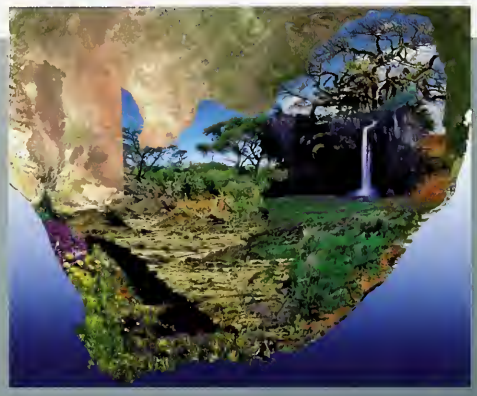
National Protected Area Expansion Strategy for South Africa 2008



Priorities for expanding the protected area network for ecological sustainability and climate change adaptation

Government of South Africa

Acronyms

C.A.P. E.	Cape Action for People and the Environment
CBD	Convention on Biological Diversity
DEA	Department of Environment Affairs (previously DEAT, became DEA in July 2009 following general elections in April 2009)
DEAT	Department of Environmental Affairs and Tourism (now DEA)
EEZ	Exclusive Economic Zone
IUCN	World Conservation Union
KZN	KwaZulu-Natal
MCM	Marine and Coastal Management Branch of DEA
MPA	Marine protected area
NBF	National Biodiversity Framework
NBSAP	National Biodiversity Strategy and Action Plan
NFEPA	National Freshwater Ecosystem Priority Areas Project
NGO	Non-government organisation
NPAES	National Protected Area Expansion Strategy
NSBA	National Spatial Biodiversity Assessment
SAIAB	South African Institute of Aquatic Biodiversity
SANBI	South African National Biodiversity Institute
SANParks	South African National Parks
SKEP	Succulent Karoo Ecosystem Programme
TFCA	Trans-frontier conservation area
WWF	Worldwide Fund for Nature

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Priorities for expanding the protected area network for ecological sustainability and climate change adaptation

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Foreword

The establishment and management of a representative and effectively managed system of protected areas is a key strategic approach in the conservation of South Africa's biodiversity and in the mitigation of the impacts of climate change on biodiversity.

The National Spatial Biodiversity Assessment 2004 effectively demonstrated that the current national protected area system does not adequately conserve a representative sample of the country's biodiversity nor is it adequate to maintain key ecological processes across the landscape and seascape. At the highest level of biodiversity assessment, namely the biome, the current system of protected areas and of conservation areas in South Africa does not afford sufficient protection to the majority of biomes and marine bioregions.

The National Protected Area Expansion Strategy was approved for implementation in March 2009.

Over the next five years, we need to add more than 2 million hectares to the land-based protected area network and more than 80 km to the inshore marine protected area network in order to achieve our 20-year protected area targets. Large areas need to be added to the offshore marine protected area network in South Africa's mainland Exclusive Economic Zone (EEZ), as well as to the offshore marine protected network in the Prince Edward Islands EEZ which forms part of South Africa's territory.

In implementing this strategy, a protected area network will be developed that supports the persistence of biodiversity within the broader landscape and safeguards the long-term provision of ecosystem goods and services (such as sufficient clean water, pollination etc.) on which we all depend, even in the face of stresses such as climate change. This role of protected areas is worthy of greater recognition in the global debate on adaptation to climate change. The implementation of this strategy will therefore ensure that South Africa takes a global lead in giving protected areas a central role in our climate change adaptation strategy.

Marthinus van Schalkwyk
Minister of Environmental Affairs and Tourism

Preface

The NPAES was commissioned by the Department of Environmental Affairs and Tourism (DEAT), now known as the Department of Environment Affairs (DEA), with technical support from the South African National Biodiversity Institute (SANBI) and South African National Parks (SANParks). It was drafted in close collaboration with key national departments, national and provincial conservation institutions.

A project team comprising SANBI, SANParks and DEAT provided technical oversight to specialist consultants contracted to draft the strategy.

A task team of the Ministerial Technical Committee's (MINTEC) Working Group 1 ('Biodiversity and Heritage') was established in June 2007 to oversee the technical drafting of the strategy.

The NPAES was further consulted with the People and Parks stakeholders and ultimately endorsed through the co-operative governance structures established by the Department of Environmental Affairs.

The NPAES was approved for implementation in March 2009.

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Executive Summary

Why a National Protected Area Expansion Strategy?

South Africa's protected area network currently falls far short of sustaining biodiversity and ecological processes. In this context, the goal of the National Protected Area Expansion Strategy (NPAES) is to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change. The NPAES highlights ways in which we can become more efficient and effective in allocating the scarce human and financial resources available for protected area expansion. It sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion. The common set of targets and spatial priorities provided by the NPAES enable co-ordination between the many role players involved in protected area expansion.

The goal of the NPAES is to achieve cost-effective protected area expansion for ecological sustainability and increased resilience to climate change. It sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion.

The role of protected areas

Protected areas are areas of land or sea that are protected by law and managed mainly for biodiversity conservation. Protected areas recognised in the National Environmental Management: Protected Areas Act (Act 57 of 2003) are considered formal protected areas in the NPAES. The Protected Areas Act provides for several categories of protected areas, including special nature reserves, national parks, nature reserves and protected environments.

It is important to differentiate protected areas from conservation areas, which are areas of land not formally protected by law but informally protected by the current owners and users and managed at least partly for biodiversity conservation. Because there is no long-term security associated with conservation areas, they are not considered a strong form of protection. Conservation areas are not a major focus of the NPAES.

Protected areas are vital for ecological sustainability and adaptation to climate change, serving as nodes in our ecological infrastructure network. This natural infrastructure is largely free, so often unnoticed or under-appreciated, but it is just as important as our extensive built infrastructure network and our social infrastructure for underpinning human livelihoods and wellbeing. South Africa has a unique opportunity to take a global lead in giving protected areas a central role in our climate change response strategy. To achieve this, the terrestrial bias of the protected area network will have to change to ensure effective inclusion of river ecosystems, wetlands, estuaries and marine ecosystems.

Protected areas are vital for ecological sustainability and adaptation to climate change, serving as nodes in our ecological infrastructure network. South Africa has an opportunity to take a global lead in giving protected areas a central role in our climate change response strategy.

Through the protection and management that they provide for priority ecosystems and catchments, protected areas help to secure the provision of important ecosystem services, such as production of clean water, flood moderation, prevention of erosion, carbon storage, and the aesthetic value of the landscape. Marine protected areas can play a particularly important role in keeping our fisheries sustainable, for example by protecting nursery grounds for commercially important fish species.

Protected areas can support rural livelihoods and local economic development. Especially in marginal agricultural areas, evidence to date suggests that conservation-related industries have higher economic potential than regular agricultural activities such as stock farming.

The relationship between protected areas and land reform has tended to be a controversial issue, with the focus usually on land claims in existing protected areas. Less attention has been paid to the opportunities for protected area expansion to actively support the land reform agenda and the diversification of rural

Protected areas can support rural livelihoods and local economic development. Especially in marginal agricultural areas, evidence to date suggests that conservation-related industries have higher economic potential than regular agricultural activities such as stock farming.

livelihood options, especially in agriculturally marginal areas. Scope exists for protected area expansion to work in partnership with land reform for mutual benefit, for example through contract agreements which establish nature reserves or other forms of biodiversity stewardship agreement on land that remains in the hands of its owners rather than being transferred to a protected area agency. The opportunity exists for local communities, as potentially major landholders through the land reform process, to have full access to the economic opportunities associated with ecotourism.

Protected areas are a powerful tool for biodiversity conservation and adaptation to climate change, but not the only one. The National Environmental Management: Biodiversity Act (Act 10 of 2004) gives us a suite of new legal tools, such as publishing bioregional plans and listing threatened ecosystems, for conserving the many biodiversity priority areas that lie outside the protected area network. These tools complement the expansion and effective management of the protected area network in pursuit of the overall goals of biodiversity conservation and sustainable development.

Scope exists for protected area expansion to work in partnership with land reform for mutual benefit, actively supporting the land reform agenda and the diversification of rural livelihoods.

Protected area targets

Protected area targets are action targets that indicate how much of each ecosystem should be included in protected areas, and help to focus protected area expansion on the least protected ecosystems. Where possible, the NPAES uses ecosystem-specific biodiversity thresholds[1] as a basis for setting protected area targets, so that the protected area targets have an underlying science-based ecological logic. The move away from looking simply at the number of hectares included in the protected area network, towards considering how those hectares are distributed across different ecosystems, is a key feature of this NPAES. It means that meeting protected area targets is not only about numbers of hectares, and that some parts of the country contribute more than others to meeting protected area targets.

The move towards ecosystem-specific protected area targets is a key feature of this NPAES. It helps to focus protected area expansion on the least protected ecosystems, and means that some parts of the landscape and seascape contribute more than others to meeting protected area targets.

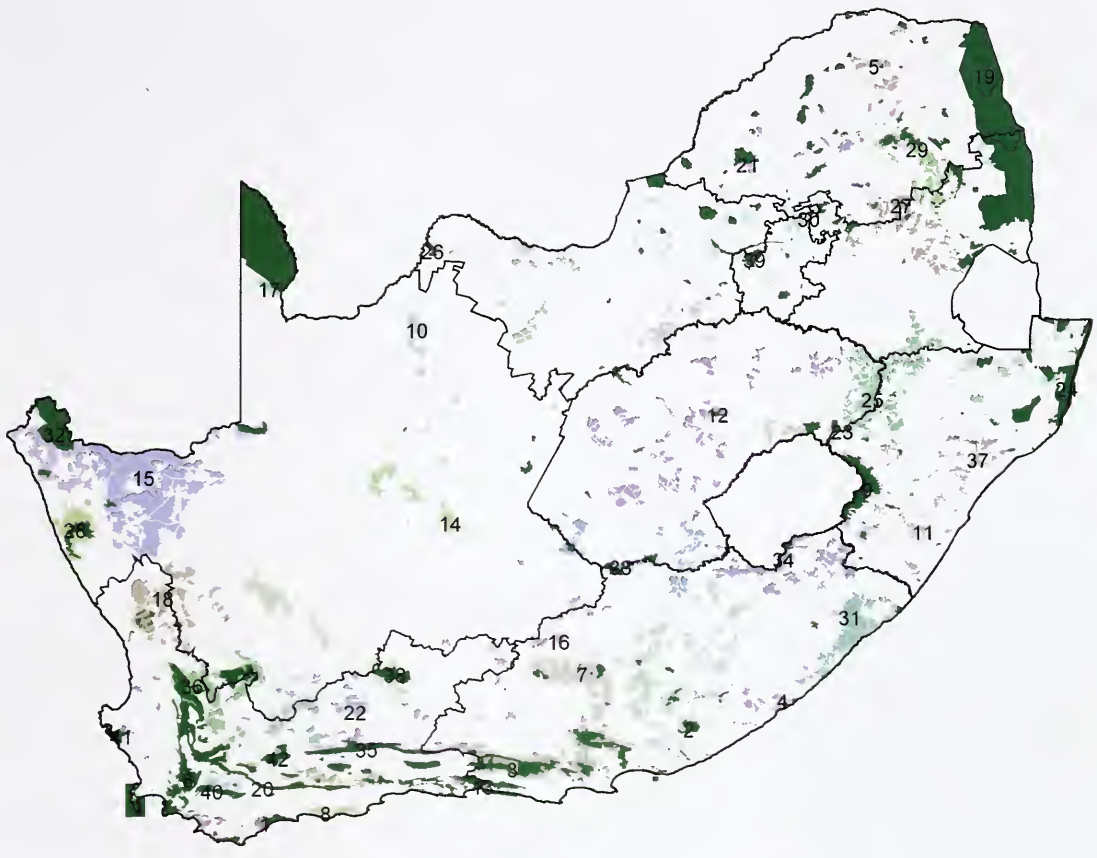
Over the next five years, in order to move a quarter of the way to meeting our 20-year protected area targets, we need to add 2.7 million hectares to the land-based protected area network, 88 km to the inshore marine protected area network (including 59 km in no-take zones), 52 500 km^2 to the offshore marine protected area network in South Africa's mainland Exclusive Economic Zone (EEZ), and 23 300 km^2 to the offshore marine protected area network in the Prince Edward Islands EEZ that forms part of South Africa's territory.

Priority areas for protected area expansion

Having set protected area targets, the next step is to determine which geographic areas are the highest priorities for protected area expansion to meet those targets. The NPAES uses **two factors, importance** and **urgency**, to identify priority areas for protected area expansion in the terrestrial environment.

An area is considered **important** for the expansion of the land-based protected area network if it contributes to meeting biodiversity thresholds for terrestrial or freshwater ecosystems, maintaining ecological processes or climate change resilience. Using systematic biodiversity planning techniques, the NPAES identifies 42 focus areas for land-based protected area expansion, shown on the map below. These are large, intact and unfragmented areas suitable for the creation or expansion of large protected areas. Each focus area has special features, but it is worth noting

[1]Biodiversity thresholds, olso referred to as biodiversity torgets, represent tipping points beyond which irreversible loss of ecosystem functioning or of species is likely to occur.



Focus areas for land-based protected area expansion (large, intact and unfragmented areas of high importance, suitable for the creation or expansion of large protected areas).

especially that the Kamiesberg Bushmanland Augrabies focus area (#15) in the Northern Cape represents the largest remaining natural area for the expansion of the protected area network, and that the Pondoland focus area (#31) in the Eastern Cape represents the last opportunity that still exists for a large coastal protected area in South Africa, with the attendant opportunities for local and regional economic development linked to coastal ecotourism.

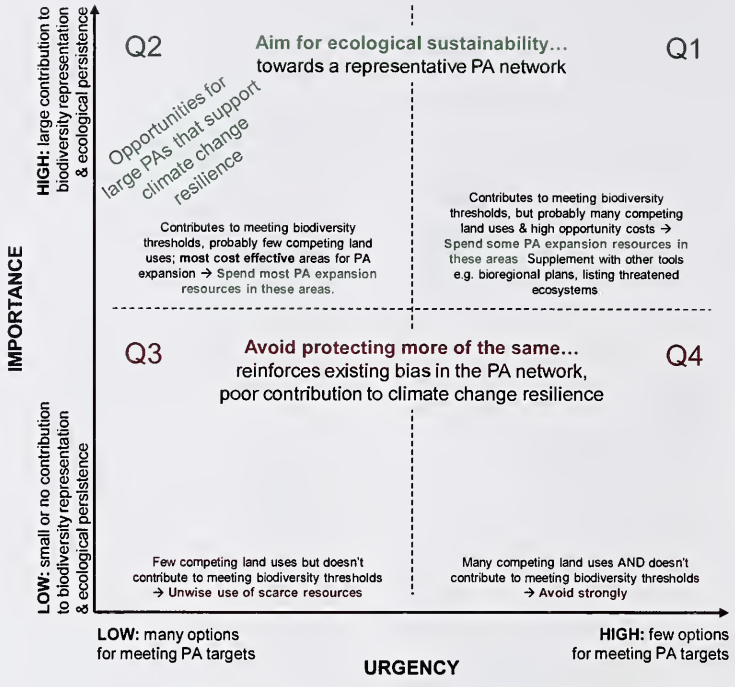
In addition to these focus areas for protected area expansion, threatened ecosystems identified in the National Spatial Biodiversity Assessment (NSBA) or listed in terms of the Biodiversity Act are important for protected area expansion. Threatened ecosystems are often highly fragmented and thus not suitable for the creation

or expansion of large protected areas, but contractual protected areas through biodiversity stewardship programmes (see discussion on mechanisms for protected area expansion below) can play a crucial role in protecting remaining natural habitat in threatened ecosystems.

Urgency, the second factor used to identify priority areas for protected area expansion, is determined by the extent to which spatial options for meeting protected area targets still exist, which is often linked to the degree of competing land or resource uses in an area, in turn often correlated with land prices.

Importance and urgency can be illustrated on a graph or matrix divided into four quadrants, as shown in the figure below. Quadrant 1 areas, those that are important and urgent, may seem like the obvious place to focus expansion efforts. However, if we focus only on the areas that are important *and* urgent, we lose opportunities to secure protected areas where there are currently fewer competing land and resource uses. Protected area expansion is often most cost effective in Quadrant 2, the important but not (yet) urgent areas. This is where, rand for rand, most can be achieved in terms of meeting biodiversity thresholds and contributing to ecological sustainability. As landscapes become fragmented, we are rapidly losing the ability to create large protected areas, which are especially

The NPAES identifies 42 focus areas for land-based protected area expansion. These are large, intact and unfragmented areas suitable for the creation or expansion of large protected areas.


IMPORTANCE
HIGH: large contribution to biodiversity representation & ecological persistence
LOW: small or no contribution to biodiversity representation & ecological persistence
Q2
Aim for ecological sustainability...
towards a representative PA network
Q1
Opportunities for large PAs that support climate change resilience
Contributes to meeting biodiversity thresholds, probably few competing land uses; most cost effective areas for PA expansion → Spend most PA expansion resources in these areas.
Contributes to meeting biodiversity thresholds, but probably many competing land uses & high opportunity costs → Spend some PA expansion resources in these areas. Supplement with other tools e.g. bioregional plans, listing threatened ecosystems
Q3
Avoid protecting more of the same...
reinforces existing bias in the PA network,
poor contribution to climate change resilience
Q4
Few competing land uses but doesn't contribute to meeting biodiversity thresholds → Unwise use of scarce resources
Many competing land uses AND doesn't contribute to meeting biodiversity thresholds → Avoid strongly
LOW: many options for meeting PA targets
HIGH: few options for meeting PA targets
URGENCY

Priority areas for protected area expansion are identified based on importance and urgency.

important form the point of view of adaptation to climate change. It is important to grasp opportunities to create viable large protected areas in currently intact landscapes. Protected area agencies should aim for a balanced portfolio of expansion activities in Quadrants 1 and 2, both of which contribute to biodiversity conservation and ecological sustainability.

As landscapes become fragmented, we are rapidly losing the ability to create large protected areas, which are especially important from the point of view of adaptation to climate change. It is important to grasp opportunities to create viable large protected areas in currently intact landscapes.

In the marine environment, priority areas for protected area expansion are based on previous work done in the NSBA 2004 and a biodiversity plan for the Prince Edward Islands EEZ. The focus for marine protected area expansion in the next five years should be predominantly on offshore marine protected areas and the Namaqua inshore bioregion. For inshore bioregions other than Namaqua, there is a need to increase the extent of no-take zones within existing marine protected areas, and to reduce the impact of exploitation in controlled zones within marine protected areas. The SANBI-DEA-WWF Offshore Marine Protected Area Project, to be completed in 2010, will provide more detail on spatial priorities for offshore marine protected areas.

The focus for marine protected area expansion in the next five years should be predominantly on offshore marine protected areas and the Namaqua inshore bioregion. In addition, there is a need to increase the extent of no-take zones within existing marine protected areas, and to reduce the impact of exploitation in controlled zones within marine protected areas.

Mechanisms for protected area expansion

There are three main mechanisms for expanding the land-based protected area network: acquisition of land, contract agreements, and declaration of public land. Each one has an important role to play, with contract agreements being used increasingly as part of biodiversity stewardship programmes.

Acquisition of land, the traditional way of establishing and expanding protected areas, involves high upfront costs and is usually used most appropriately in Quadrant 2 expansion. **Contract agreements**, in which landowners maintain ownership of their land but enter into a contract with a protected area agency in return for formal protected area status, are facilitated by provisions in the Protected Areas Act. They are appropriate for Quadrant 1 or 2 expansion. Contract agreements are attractive because they tend to cost protected area agencies less than acquisition, and because by far the largest proportion of land in the focus areas for protected area expansion is in private hands. Biodiversity stewardship programmes should be strengthened so that more use can be made of contract agreements in the expansion of the protected area network. There are significant potential synergies between stewardship programmes, land reform and rural development. **Declaration of public or state land** involves reassigning land to a protected area agency from another organ of state, and is appropriate for Quadrant 1 or 2 expansion. It has limited applicability because only a small proportion of land in the focus areas for protected area expansion is public land.

Contract agreements are a key mechanism for expanding the protected area network. They are often much more cost effective than acquisition of land, and are used increasingly as part of biodiversity stewardship programmes.

Mechanisms for expanding the marine protected area network and for securing protected areas specifically focused on freshwater ecosystems are more complex and require further exploration.

Financial tools for protected area expansion

Protected area expansion draws on several sources of finance, all of which have an important role to play given the size of the task of achieving protected area targets. Based on land price data from 2005 to 2007, the estimated cost of purchasing the land needed to meet all 20-year land-based protected area targets would be R23 billion. Although this would arguably be a good national investment in climate change adaptation, it is nevertheless a prohibitive cost for protected area agencies, highlighting the importance of expansion mechanisms other than land acquisition, particularly contract agreements through biodiversity stewardship programmes.

The new fiscal incentives contained in the Revenue Laws Amendment Act (Act 60 of 2008), effective from March 2009, are likely to provide a significant boost to protected area expansion by making defined conservation management costs tax deductible for landowners who have entered into a contract agreement. Additional biodiversity-related fiscal reform options being explored include reducing the transaction costs associated with land acquisition for protected areas, removing perverse incentives in municipal property rates, and using Expanded Public Works Programme funding as an incentive to encourage landowners to enter into contract agreements.

New fiscal incentives for landowners who have entered into contract agreements are likely to provide a significant boost to protected area expansion. Further innovative financial mechanisms that should be piloted include a revolving land fund and payments for ecosystem services in cases where protected areas contribute to, for example, catchment management and water supply.

Innovative financial mechanisms for protected area expansion that should be piloted include a revolving land fund and payments for ecosystem services in cases where protected areas contribute to, for example, catchment management and water supply.

Who implements and monitors the NPAES?

Protected area agencies, including provincial conservation authorities, South African National Parks (SANParks), World Heritage Site Authorities and the Marine and Coastal Management Branch of DEA (MCM), are the primary implementers of the NPAES, and should each develop an agency-specific protected area expansion implementation plan based on the NPAES targets and focus areas. The Protected Area CEOs Forum will ensure alignment of the efforts of the multiple agencies involved in protected area expansion, provide a forum for discussing challenges and sharing lessons, and track progress towards meeting protected area targets. Establishing and strengthening provincial biodiversity stewardship programmes is an institutional priority for provincial conservation authorities and for DEA.

Information gaps and research priorities

Key information gaps that should be filled for future revisions of the NPAES include:

- an accurate spatial layer of existing protected areas,
- maps and classifications of marine ecosystems and habitats,
- a complete national wetlands map,
- a national spatial data layer on land ownership and tenure.

Research priorities include:

- further exploration of the role of protected areas in supporting ecosystem-based adaptation to climate change,
- ecologically meaningful biodiversity thresholds for aquatic ecosystems,
- innovative ways to consider land price and opportunity costs in the identification of priority areas for protected area expansion,
- past and present trends in the funding of protected area expansion,
- likely costs of different mechanisms for protected area expansion into the future,
- relative income and job creation potential of regular agriculture compared with protected areas and ecotourism,
- research to support and evaluate pilot projects in which biodiversity stewardship agreements are used to support land reform and rural development.

1. Why a National Protected Area Expansion Strategy?

CHAPTER SUMMARY

The overall goal of the NPAES is to achieve cost-effective protected area expansion for ecological sustainability and adaptation to climate change. The NPAES highlights ways in which we can become more efficient and effective in allocating the scarce resources available for protected area expansion. It sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion.

The NPAES provides a common set of targets and spatial priorities to guide efforts and enable co-ordination among the many role players involved in protected area expansion. This is particularly important in the context of South Africa's globally exceptional biodiversity richness on the one hand, and significant financial and human resource constraints on the other.

The NPAES does not address the challenge of improving biodiversity management effectiveness in existing and new protected areas, which needs attention alongside the implementation of the NPAES.

The National Protected Area Expansion Strategy (NPAES) provides South Africa's first national assessment of priority areas for protected area expansion based on systematic biodiversity planning principles, dealing with both terrestrial and aquatic environments. It is one of the first of its kind globally[2]

South Africa's current protected area network is insufficient to conserve biodiversity and ecological processes effectively, or to play its full potential role in providing resilience to the impacts of climate change. This is because of the *ad hoc* way the protected area network has developed over time, protecting some ecosystems well and others hardly at all. Freshwater, estuarine and offshore marine ecosystems are especially poorly included in the protected area network.[3]

The overall goal of the NPAES is to achieve cost-effective protected area expansion for ecological sustainability and adaptation to climate change. The NPAES highlights ways in which we can become more efficient and effective in allocating the scarce resources available for protected area expansion. It sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion.

South Africa's current protected area network is insufficient to conserve biodiversity and ecological processes effectively, or to play its full potential role in providing resilience to the impacts of climate change. Freshwater, estuarine and offshore marine ecosystems are especially poorly included in the protected area network.

While the primary roles of the protected area network are ecological sustainability and resilience to climate change, protected areas also deliver significant socio-economic benefits, especially in rural areas, thus contributing to South Africa's overall development goals.

While the primary roles of the protected area network are ecological sustainability and resilience to climate change, protected areas also deliver significant socio-economic benefits, especially in rural areas, thus contributing to South Africa's overall development goals.

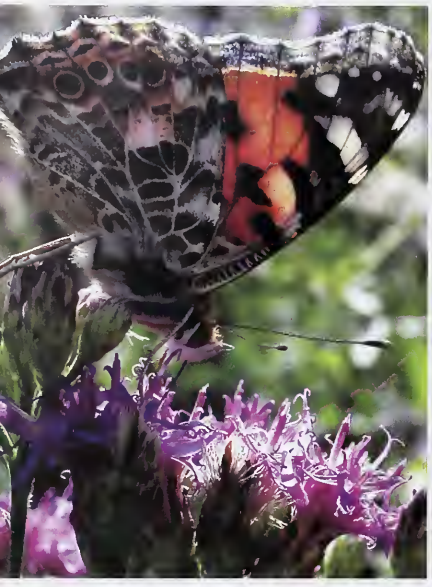
Many role players, public and private, are involved in creating, expanding and managing protected areas in South Africa. The NPAES provides a common set of targets and spatial priorities to guide efforts and enable co-ordination. This is particularly important in the context of South Africa's globally exceptional biodiversity richness on the one hand, and significant financial and human resource constraints on the other.

The development of the NPAES was led by the Department of Environmental Affairs (DEA),[4] with technical support from the South African National Biodiversity Institute (SANBI), in consultation with protected area agencies

[2]Internationally, few national or regional protected areas strategies are available. Those that are available tend to deal only with either marine or land-based protected areas, and do not necessarily use systematic biodiversity planning principles. See, for example, Canada's Federal Marine Protected Areas Strategy (2005), North-West Territories Protected Areas Strategy (1999), Tasmanian Marine Protected Areas Strategy (2000), Yukon Protected Areas Strategy (2003). An Australian protected area expansion strategy is under way.

[3]These points were highlighted in the National Spatial Biodiversity Assessment (NSBA) 2004 (Driver *et al.* 2005), which included an assessment of current protection levels of all ecosystems. The NPAES builds on the NSBA 2004.

[4]Previously the Department of Environmental Affairs and Tourism. In July 2009, following general elections in April 2009, DEAT became DEA.



and other key stakeholders. The development of the NPAES and the implementation of its first five-year phase are highlighted in the National Biodiversity Framework (NBF) (DEAT 2008) as two of 33 priority actions for the biodiversity sector between 2008 and 2013. The NPAES is a 20-year strategy with 20-year targets and five-year targets. It will be revised every five years.

The NPAES does not deal with site-scale planning on exactly which sites should be included in the protected area network, or with detailed implementation planning for expanding protected areas. Both of these are most appropriately done by protected area agencies, using the NPAES as a guide.

Expansion of the protected area network should take place concurrently with an effort to improve biodiversity management effectiveness within existing and new protected areas. This challenge is not addressed in the NPAES, but requires attention alongside the implementation of the NPAES, particularly in some provincial and municipal protected area agencies. It should include a focus on management and compliance in marine protected areas.

This document summarises the key findings and recommendations of the NPAES. It is intended to be used by all those who play or could play a role in protected area expansion, including protected area agencies and managers, conservation NGOs and funding agencies, policymakers in relevant national departments, municipalities and the private sector.

Chapter 2 outlines why protected areas are important and valuable. Chapter 3 gives the protected area targets that should guide expansion of the protected area network. Chapter 4 discusses priority areas for protected area expansion, considering both importance and urgency. Chapter 5 reviews the main mechanisms available for protected area expansion, and Chapter 6 looks at some of the financial issues involved. Chapter 7 discusses roles and responsibilities in the implementation of the NPAES. Chapter 8 highlights information gaps and research needs, and finally Chapter 9 touches on some of the legal issues that may need attention in order to streamline protected area expansion.

More detailed technical information is available in a supporting document, the NPAES Resource Document, which is likely to be used mostly by protected area agencies and managers.

2. The role of protected areas

CHAPTER SUMMARY

Protected areas are vital for ecological sustainability and adaptation to climate change, serving as nodes in our ecological infrastructure network. They can also support land reform, rural livelihoods, ecosystem services and socio-economic development. South Africa has a unique opportunity to take a global lead in giving protected areas a central role in our climate change response strategy. To achieve this, the terrestrial bias of the protected area network will have to change to ensure effective inclusion of river ecosystems, wetlands, estuaries and marine ecosystems.

Protected areas are vital nodes in South Africa's ecological infrastructure. Our ecological infrastructure consists of nodes and corridors of natural habitat that provide a range of ecosystem services as well as resilience to the impacts of climate change and natural disasters. This natural infrastructure is largely free, so often unnoticed or under-appreciated, but it is just as important as our extensive built infrastructure network and our social infrastructure for underpinning human livelihoods and wellbeing.

Below we highlight four of the most important contributions of protected areas, some of them only partially realised and all worthy of further attention:

- biodiversity conservation and ecological sustainability,
- adaptation to climate change,
- land reform and rural livelihoods,
- socio-economic development, including ecosystem services.

Trans-frontier conservation areas (TFCAs), of which there are six shared between South Africa and our neighbouring countries, provide opportunities for scaling up all of the above contributions of protected areas and for strengthening the links between ecological sustainability benefits and socio-economic benefits.

Protected areas are vital nodes in South Africa's ecological infrastructure. They help to ensure functional landscapes that provide stable environments for the benefit of human wellbeing.

Protected areas for biodiversity conservation and ecological sustainability

Protected areas are the most secure and effective mechanism for conserving a representative sample of all biodiversity including all ecosystems and species. This is especially important in South Africa because of our globally exceptional levels of biodiversity richness. Conserving a viable representative sample of biodiversity contributes to ecological resilience and is one of the cornerstones of ecological sustainability.

Historically, the protected area network has been biased towards some ecosystems, such as indig-

What are protected areas?

Protected areas are areas of land or sea that are formally protected by law and managed mainly for biodiversity conservation. Protected areas recognised in the National Environmental Management: Protected Areas Act (Act 57 of 2003) are considered formal protected areas in the NPAES.[5] The Protected Areas Act distinguishes between several categories of protected area: special nature reserves, national parks, nature reserves, and protected environments. It also recognises world heritage sites, marine protected areas, specially protected forest areas, and mountain catchment areas.

In the NPAES, we distinguish between land-based protected areas, which may protect both terrestrial and freshwater biodiversity features, and marine protected areas.

What are conservation areas?

It is important to differentiate protected areas from conservation areas. Conservation areas are areas of land not formally protected by law but informally protected by the current owners and users and managed at least partly for biodiversity conservation. Because there is no long-term security associated with conservation areas, they are not considered a strong form of protection. Conservation areas are not a major focus of the NPAES.

[5]The IUCN defines a protected area as an area of land and/ar sea especially dedicated to the protection and maintenance af biological diversity and of natural and assaciated cultural resources, and managed thraugh legal ar other effective means. This is a broader definitian than the one used in the NPAES as it includes areas that are nat legally protected and that we would define as conservatian areas rather than protected areas.

enous forests, mountain fynbos and lowveld savanna, and has done a poor job of protecting others. Aquatic ecosystems, including rivers, wetlands, estuaries and offshore marine ecosystems, have been especially neglected. Increased focus is required on the need for South Africa's protected area network to include a representative sample of all ecosystems, as discussed further in Chapter 3 on protected area targets.

The long-term persistence of biodiversity depends not only on conserving a representative sample of biodiversity but also on maintaining a complex set of ecological processes, such as the functioning of river corridors and movement of species between uplands and lowlands. Ecological processes often occur across very large areas and over long periods of time, so they can be difficult to capture in the protected area network. Nevertheless, it is possible to take some ecological processes into account in the design of the protected area network. Spatial aspects of ecological processes that have been mapped and included in the NPAES, as explained in Chapter 4, include climate and landscape heterogeneity, coastal ecological processes, habitat heterogeneity, river-associated movement corridors, free-flowing rivers, and rivers supporting priority estuaries.

For protected areas to achieve their full potential contribution to ecological sustainability, they need to include a representative sample of all ecosystems as well as key ecological processes, and we need to shift towards an integrated terrestrial and aquatic approach to protected area design and management. This is especially important in South Africa where water scarcity means that freshwater ecosystems are under even greater pressure than terrestrial ecosystems.

Estuaries can provide a focal point for integrating the design of terrestrial, freshwater and marine protected areas. Ideally seamless integration is required between terrestrial, freshwater, estuarine,

Trans-frontier conservation areas, of which there are six shared between South Africa and our neighbouring countries, provide opportunities for scaling up all of the above contributions of protected areas and for strengthening the links between ecological sustainability benefits and socio-economic benefits.

For protected areas to achieve their full potential contribution to ecological sustainability, they need to include a representative sample of all ecosystems as well as key ecological processes, in both aquatic and terrestrial environments. Ideally seamless integration is required between terrestrial, freshwater, estuarine, inshore and offshore marine protected areas, to maximise the ecological sustainability benefits of protected areas.

inshore and offshore marine protected areas, to maximise the ecological sustainability benefits of protected areas. The NPAES moves some way towards this ideal, but further work is needed. Future revisions of the NPAES will include more detailed work on aquatic ecosystems and on integrating the design of aquatic and terrestrial components of the protected area network.

Protected areas for adaptation to climate change

Healthy natural ecosystems can increase resilience to the impacts of climate change, by allowing ecosystems and species to adapt as naturally as possible to the changes and by buffering human settlements and activities from the impacts of extreme climate events. A sufficient protected area network supports the persistence of biodiversity within the broader landscape and safeguards the long-term provision of ecosystem

goods and services (such as sufficient clean water, pollination etc.) on which we all depend, even in the face of stresses such as climate change. Intact ecosystems (i.e. ecosystems that are in a natural or near-natural state) withstand stresses better than highly modified and fragmented landscapes, and natural landscapes secured within protected areas are the anchor on which survival of broader ecological systems will depend. This role of protected areas is worthy of greater emphasis in the global debate on climate change adaptation. South Africa has a unique opportunity to take a global lead in giving protected areas a central role in our climate change response strategy.

An implication of this is that protected area expansion should prioritise protection of living connected landscapes. Protected areas should be expanded to incorporate altitudinal gradients and topographic range, intact river corridors, coastal dune cordons, and a greater range of microhabitats, in order to conserve the climatic gradients required to give us some leeway for climate change. The ability of species and systems to adapt to climate change will depend on landscapes that are sufficiently connected to allow species to move. These factors have been taken into account in identifying important geographical areas for protected area expansion, as explained in Chapter 4.

Freshwater ecosystems are likely to be particularly hard hit by rising temperatures and shifting rainfall patterns, and yet healthy, intact freshwater ecosystems are vital for maintaining resilience to climate change and mitigating its impact on human wellbeing.[6] In the western part of South Africa, which is likely to become dryer, intact rivers and wetlands will help to maintain a consistent supply of water; in the eastern part of the country, which is likely to become wetter, intact rivers and wetlands will be important for reducing flood risk and mitigating the impact of flash floods. This reinforces the importance of including freshwater ecosystems in land-based protected areas, and moving towards integrated aquatic and terrestrial design of the protected area network.

Healthy natural ecosystems can increase resilience to the impacts of climate change, by allowing ecosystems and species to adapt as naturally as possible to the changes and by buffering human settlements and activities from the impacts of extreme climate events. South Africa has an opportunity to take a global lead in giving protected areas a central role in our climate change response strategy.

Protected areas for land reform and rural livelihoods

The relationship between protected areas and land reform has tended to be a controversial issue, with the focus usually on land claims in existing protected areas. Land redistribution more broadly is usually seen as going hand in hand with agrarian development rather than protected area expansion.[7] Little attention has been paid to the opportunities for protected area expansion to support the land reform agenda and the diversification of rural livelihood options, especially in agriculturally marginal areas.[8]

Scope exists for protected area expansion to work in partnership with land reform for mutual benefit, for example through contract agreements which establish nature reserves or other forms of biodiversity stewardship agreement on land that remains in the hands of its owners rather than being transferred to a protected area agency (see Chapter 5 for more on biodiversity stewardship programmes). Contract agreements are increasingly used in expansion of the protected area network and represent opportunities for mutual benefit between landowners, who receive incentives and assistance with management, and protected area agencies. Biodiversity stewardship programmes allow for considerable flexibility in the nature of

[6]For example, Palmer *et al.* (2008) find that the need for management action to mitigate the impacts of climate change will be much greater for catchments impacted by dams than for those with free-flowing rivers.

[7]This is evident in the Department of Land Affairs' programme on Land Redistribution for Agricultural Development (LRAD) and the Land and Agrarian Reform Programme (LARP).

[8]This is particularly relevant in light of the acknowledgement by the Department of Land Affairs (since July 2009 the Department of Rural Development and Land Reform) that over 50% of land reform projects are not providing post-settlement benefits to the communities involved.

agreements concluded. For example, it is possible for part of the land involved to be formally proclaimed a protected area, and part not. The Richtersveld National Park, the Makuleke section of Kruger National Park and iSimangaliso Wetland Park provide good examples of community ownership of formal protected areas through contract agreements, with iSimangaliso in particular providing exciting examples of significant local economic development where communities share in the benefits of major protected area-related developments.

In the past, local communities have often been only minor recipients of benefits generated by protected areas, as in most cases they have not been owners of either the protected area land or the tourist facilities on that land. The opportunity now exists for local communities, as potentially major landholders through the land reform process, to have full access to the economic opportunities associated with ecotourism. As discussed in the next section on socio-economic development, protected areas often represent a promising option for economic development in rural regions, providing more jobs than commercial agriculture would.

Scope exists for protected area expansion to work in partnership with land reform for mutual benefit, actively supporting the land reform agenda and the diversification of rural livelihoods.

Bioregional programmes such as Cape Action for People and the Environment (C.A.P.E.), the Succulent Karoo Ecosystem Programme (SKEP) and the Grasslands Programme provide opportunities for piloting a co-operative approach to land reform and protected area expansion. SANBI has initiated the design of a land reform and biodiversity stewardship programme, building on pilot projects under way in the bioregional programmes.

Protected areas for socio-economic development

Protected areas are important for socio-economic development in several ways: rural development and local economic development with immediate benefits to surrounding communities; contributing to Brand South Africa as a key attraction for foreign and national tourists; providing ecosystem services; and safeguarding the wellbeing of future generations.

Protected areas can be a cornerstone for **local economic development**, providing immediate socio-economic benefits to surrounding communities, especially if this is an explicit aspect of the management goals of the protected area. There is increasing sensitivity in the design and management of protected areas to the needs of local and regional communities, with protected areas seen not as isolated islands but as part of the socio-economic as well as the ecological environment. DEA's People and Parks Programme, initiated in 2004, is significant in this regard.

In many rural regions, ecotourism based on protected areas provides a more viable option for economic development and livelihoods than agriculture, even though agriculture is currently often the main focus for rural socio-economic development. As mentioned in the previous section, land reform provides the opportunity for communities to become landholders in protected areas and to benefit directly from ownership of ecotourism ventures.

Especially in marginal agricultural areas, evidence to date suggests that conservation-related industries (protected areas, ecotourism on private reserves, game farming etc.) have higher economic potential than regular agricultural activities such as stock farming. For example, a study in the Thicket Biome in the Eastern Cape showed that a change from livestock farming to ecotourism resulted in four times the income per hectare and double the number of jobs per 100 hectares (Sims-Castley 2002). In Namaqualand, anecdotal evidence suggests that the Namaqua National Park creates twice as many jobs as commercial farming on an equivalent area of land.[9] The most valuable rural land in the country outside peri-urban development nodes, based on 2005–2007 land prices, is found on the boundaries of the Kruger National Park, suggesting that game farming and ecotourism provide the most lucrative land use option in at least some parts of the country. Further research and support for pilot initiatives is required to formally test this evidence and to determine whether these economic trends can be generalised to other parts of South Africa.

[9]Although this evidence from Namaqualand is onecdotal and has yet to be formally tested, it corroborotes the Sims-Costley (2002) figure ond suggests o promising ovenue for research and further investigation.

Protected areas can be a cornerstone for local economic development, especially if this is an explicit aspect of protected area management goals. Especially in agriculturally marginal areas, evidence to date suggests that conservation-related industries have higher economic potential than regular agricultural activities such as stock farming.

The protected area network forms part of **South Africa's competitive advantage** as a nation, creating destinations for nature-based tourism, providing a draw card for international interest and attention, and acting as a unique selling point for Brand South Africa. Our national identity includes the spectacular varied natural environment that is secured through our protected area network.

Through the protection and management they provide for priority ecosystems and catchments, protected areas help to secure the provision of important **ecosystem services**, such as production of clean water, flood moderation, prevention of erosion, carbon storage, and the aesthetic value of the landscape. Mountain catchment areas deserve mention here for the especially important role they play in safeguarding water supplies.

Marine protected areas also deserve particular mention for the role they can play in sustaining commercial, recreational and subsistence fisheries resources. A recent study noted that globally 75% of fish stocks are fully exploited or over-exploited, and fishing pressure continues to threaten marine ecosystems and the cultures and economies that depend on them (Griffith 2008). Marine protected areas can help to address this by protecting spawning (breeding) stocks of fish species and allowing recovery of over-exploited fish species, which results in improved fishing yields outside marine protected areas through a spill-over effect. Often marine protected areas are the only areas in which viable numbers of reproductive fish are found. It is worth noting that *no-take marine protected areas* or *no-take zones* within marine protected areas, of which there are few in South Africa, play this role most effectively. Marine protected areas that are not declared no-take can actually become nodes for increased exploitation of fisheries by recreational, subsistence and/or commercial fishers and thus contribute to over-exploitation. This can be addressed by

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placing tighter restrictions on such use (for example catch and release recreational fishing), or by increasing the number and size of strategically placed no-take zones within marine protected areas, or both. Together these measures could dramatically increase the contribution of marine protected areas to sustaining the affected fisheries and especially to reversing the current collapsed status of many of South Africa's line fish species. (See Chapter 3 for further discussion on this.)

Last but not least, by contributing to climate change adaptation and protecting aquatic and terrestrial ecosystems and the services they provide, the protected area network safeguards the socio-economic **wellbeing of future generations**. The costs to future generations of *not* building and maintaining an effective protected area network are complex to quantify, but we can be sure they are substantial.

Other biodiversity management tools

Protected areas are a powerful tool for conserving biodiversity and adapting to climate change, but not the only one. The National Environmental Management: Biodiversity Act (Act 10 of 2004) gives us a suite of new legal tools for conserving the many biodiversity priority areas that lie outside the protected area network and for various reasons are likely to remain outside it. These tools include bioregional plans, biodiversity management plans, listing of threatened or protected ecosystems, listing of threatened or protected species, and regulations on alien and invasive species. In addition to regulatory tools provided by the Biodiversity Act, economic mechanisms such as environmental fiscal reform and payment for ecosystem services are currently being explored and piloted in South Africa. The Marine Living Resources Act (Act 18 of 1998) provides for additional mechanisms for biodiversity management over and above marine protected areas, and South Africa is in the process of implementing the ecosystem approach to fisheries management. This wide range of biodiversity management tools complements the expansion and effective management of the protected area network in pursuit of the overall goals of biodiversity conservation and sustainable development.

3. Protected area targets

CHAPTER SUMMARY

Protected area targets are action targets that indicate how much of each ecosystem should be included in protected areas, and help to focus protected area expansion on the least protected ecosystems. Where possible, the NPAES uses biodiversity thresholds as a basis for setting protected area targets, so that protected area targets have an underlying science-based ecological logic. The move away from looking simply at the number of hectares included in the protected area network, towards considering how those hectares are distributed across different ecosystems, is a key feature of this NPAES. It means that meeting protected area targets is not just about numbers of hectares, and that some hectares contribute more to meeting protected area targets than others.

South Africa's current protected area network falls far short of sustaining biodiversity and ecological processes. In the next five years, in order to move a quarter of the way to meeting our 20-year protected area targets, we need to add 2.7 million hectares to the land-based protected area network, 88 km to the inshore marine protected area network (including 59 km in no-take zones), 52 500 km^2 to the offshore marine protected area network in South Africa's mainland Exclusive Economic Zone (EEZ), and 23 300 km^2 to the offshore marine protected area network in the Prince Edward Islands EEZ that forms part of South Africa's territory. The land-based and inshore protected area targets are further broken down by terrestrial vegetation types and inshore marine bioregions respectively. Although explicit protected area targets have not been set for freshwater ecosystems in this NPAES, biodiversity thresholds for river ecosystems helped to determine the priority areas for land-based protected area expansion (Chapter 4), so meeting land-based protected area targets will help to increase protection levels of under-protected river ecosystems as well as under-protected vegetation types. Explicit protected area targets have not been set for estuaries, but two existing sub-national conservation plans for estuaries cover most of South Africa's estuaries and should be used to guide the expansion of estuarine protected areas in the absence of national targets. Future revisions of the NPAES will refine protected area targets for offshore marine ecosystems, and develop protected area targets for estuarine and freshwater ecosystems.

Protected area targets are action targets that indicate how much of each ecosystem should be included in protected areas, thus guiding protected area expansion to focus on ecosystems that are least protected. They should be stretch targets but not unrealistically ambitious. Internationally, the Convention on Biological Diversity (CBD) commits governments to protecting a minimum of 10% of each habitat type by 2010. This flat target of 10% is relatively arbitrary, with no compelling ecological rationale. In the South African context, with our globally exceptional levels of biodiversity richness, we need a higher level of protection.

Systematic biodiversity planning[10] uses biodiversity thresholds[11] to determine which areas of the landscape and seascape are most important for conserving a representative sample of biodiversity pattern (ecosystems and species) and for keeping key ecological processes intact. Biodiversity pattern thresholds for terrestrial ecosystems in South Africa range from 16% to 36% of the original extent of each ecosystem, with higher thresholds for more species-rich ecosystems. For freshwater and marine ecosystems, we have used an estimated 20% biodiversity pattern threshold in the absence of better data.[12]

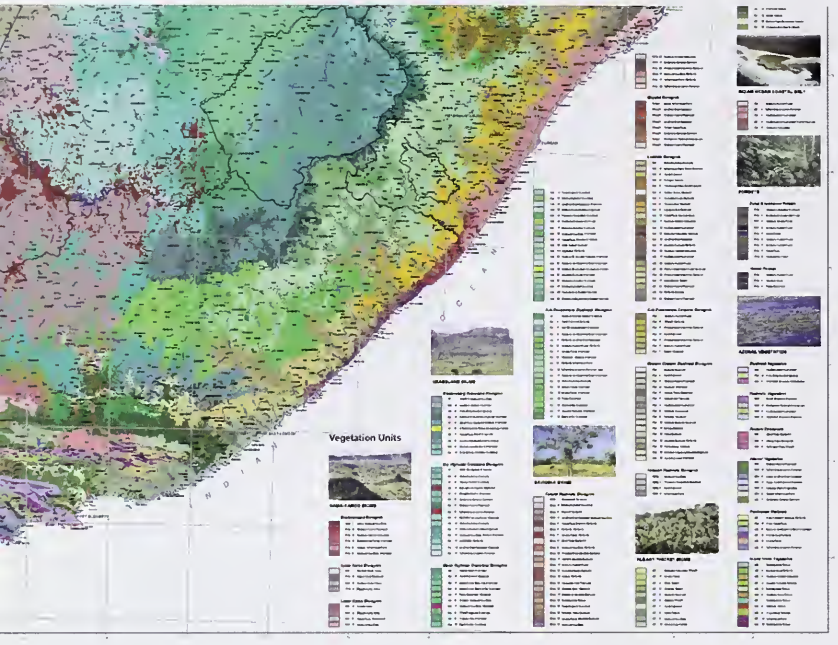
The protected area targets in this NPAES are linked to biodiversity thresholds, so that protected area targets have an underlying science-based ecological logic. The very long-term goal should be to incorporate in the protected area network at least that proportion of each ecosystem required to meet its biodiversity pattern threshold.

The move away from looking simply at the number of hectares included in the protected area network, towards considering how those hectares are distributed across different ecosystems, is a key feature of this NPAES. It means that meeting protected area targets is not just about

[10]Systematic biadiversity planning, alsa knawn as systematic canservatian planning, is the standard appraach ta biadiversity planning in Sauth Africa and increasingly elsewhere in the warld. It represents best available science far determining spatial biadiversity priarities. Far backgraund an the principles and methads af systematic biadiversity planning see Driver *et al.* (2003).

[11]Biadiversity threshalds are alsa referred ta as biadiversity targets, far example in the NSBA 2004. Hawever, they are mare accurately characterised as threshalds, as they represent tipping paints beyand which irreversible lass af ecasystem functianing ar af species is likely ta accur.

[12]Determining ecalagically meaningful threshalds far aquatic ecasystems is an impartant research priarity, as highlighted in Chapter 8.



Example of vegetation types from the Eastern Cape (Mucina & Rutherford 2006).

numbers of hectares, and that a hectare in one place is not necessarily equivalent to a hectare somewhere else. Alternatively put, some hectares contribute more to meeting protected area targets than others. This represents a considerable shift in thinking, and may take some time to be mainstreamed among the full range of role players involved in protected area expansion.

The move towards ecosystem-specific protected area targets is a key feature of this NPAES. It helps to focus protected area expansion on the least protected ecosystems, and means that some parts of the landscape and seascape contribute more than others to meeting protected area targets.

Summary of targets for land-based and marine protected areas

Table 1 gives a summary of the NPAES targets for land-based and marine protected areas. The overall 20-year targets are based on the long-term targets in the National Biodiversity Strategy and Action Plan (NBSAP) (DEAT 2005), linked to ecosystem-level biodiversity thresholds where possible. The additions needed in the next five years are a quarter of the way between where we are now and the 20-year targets.

South Africa's current protected area network falls far short of sustaining biodiversity and ecological processes. Table 1 shows that in the next five years, in order to move a quarter of the way to meeting our 20-year protected area targets, we need to add 2.7 million hectares to the land-based protected area network, 88 km to the inshore marine protected area network (including 59 km in no-take zones), 52 500 km^2 to the offshore marine protected area network in South Africa's mainland Exclusive Economic Zone (EEZ), and 23 300 km^2 to the offshore marine protected area network in the Prince Edward Islands EEZ.

The summarised land-based protected area targets in Table 1 are built up from more detailed ecosystem-level targets, discussed in the sections that follow. The more detailed targets are crucial for ensuring that protected area expansion does not just provide more protection for already well-protected ecosystems. They help to determine where the priority areas for protected area expansion are, discussed in Chapter 4.

The detailed ecosystem-level targets also explain why the increases in protected area extent required in the next 20 years and

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Table 1. Summary of land-based and marine protected area targets, and areas still required to meet targets

	20-year target	Current protection level*	Addition needed to meet 20-year target	Addition needed in next 5 years
Land-based	12%	6.5% (7.9 m ha)	8.8% (10.8 m ha)	2.2% (2.7 m ho)
Marine inshore**	Na-take: 15%	Na-take: 9.1% (334 km)	No-take: 6% (234 km)	No-take: 1.5% (59 km)
	Tatal: 25%	Tatal: 21.5% (785 km)	Tatal: 9.6% (353 km)	Totol: 2.4% (88 km)
Marine offshore: mainland EEZ	Na-take: 15%	Na-take: 0.16% (1 671 km^2)	Na-take: 14.8% (159 111 km^2)	Na-take: 3.7% (39 887 km^2)
	Tatal: 20%	Tatal: 0.4% (4 172 km^2)	Tatal: 19.6% (210 205 km^2)	Tatal: 4.9% (52 551 km^2)
Marine offshore: Prince Edward Islands EEZ	No-take: 15%	Na-take: 0% ***	No-take: 15% (70 032 km^2)	Na-take: 3.8% (17 508 km^2)
	Tatal: 20%	Tatal: 0% ****	Tatal: 20% (93 376 km^2)	Total: 5% (23 344 km^2)

Table notes:

* An area is considered protected if it falls within a protected area recognised in the Protected Areas Act.

** Inshore marine targets are measured in kilometres of coastline because of the varying distances that inshore MPAs extend from the coastline. Inshore is considered to mean from the high-water mark to the 30 m depth contour. All inshore MPAs extend at least this far. In future we will move towards using a more accurate area-based measure for inshore MPA targets, but this is not possible with current data.

*** Fishing has been excluded from a 12 nautical mile exclusion zone immediately around the islands (3% of the Prince Edward Islands EEZ) but the area has not been promulgated as an MPA.

**** The intention to declare a marine protected area in the Prince Edward Islands EEZ was published for comment by the Minister of Environmental Affairs in the *Government Gazette* on 8 May 2009. At the time of finalising this document, the process had not been concluded and the protected area had not yet been established.

the next five years are not simply the difference between current overall protection levels and required protection levels, illustrating the point that not all hectares or kilometres are equivalent when it comes to meeting protected area targets. Especially striking is the fact that we need an additional 8.8% of the country in land-based protected areas, over and above the current 6.5%, in order to meet 20-year protected area targets that average 12% across all terrestrial ecosystems. This reflects the fact that many ecosystems are currently completely unrepresented in the protected area network, as discussed further in the next section.

Targets for marine protected areas in South Africa have previously been given as one single figure for all marine ecosystems. However, it is more useful to distinguish between inshore marine ecosystems, offshore marine ecosystems in South Africa's mainland EEZ, and offshore marine ecosystems in the Prince Edward Islands EEZ, so that different targets can be set for these three groups of ecosystems. Many people are unaware that South Africa is responsible not just for the marine EEZ surrounding our mainland, which extends 200 nautical miles from our coastline, but also for the EEZ surrounding the Prince Edward Islands, which are part of South Africa's territory. The Prince Edward Islands EEZ is 44% of the size of the mainland EEZ (see Figure 2), and has no declared protected areas.[13]

The NPAES has not set explicit protected area targets for estuaries. However, two existing sub-national conservation plans for estuaries cover over 80% of South Africa's 270 estuaries and provide targets and priorities for estuarine protected areas.[14] These should be used as the basis for expanding estuarine protected areas in the absence of national targets. Estuaries will receive significant attention in the upcoming National Spatial Biodiversity Assessment (NSBA) 2010.

Land-based protected area targets

The protected area targets for land-based protected areas are based on underlying ecosystem-level targets for terrestrial vegetation types, as explained below. Although explicit protected area

[13]The intention to declare o morine protected orea in the Prince Edward Islands EEZ was published for comment by the Minister of Environmental Affairs in the *Government Gazette* on 8 Moy 2009. At the time of finolising this document, the process hod not been concluded ond the protected oreo had not yet been established.

[14]These are Turpie & Clark's (2007) conservation plon for temperate South African estuories, done os part of the C.A.P. E. Regionol Estuarine Monogement Programme, and Ezemvelo KZN Wildlife's conservotion plan for KZN estuaries (plon completed, report forthcoming).

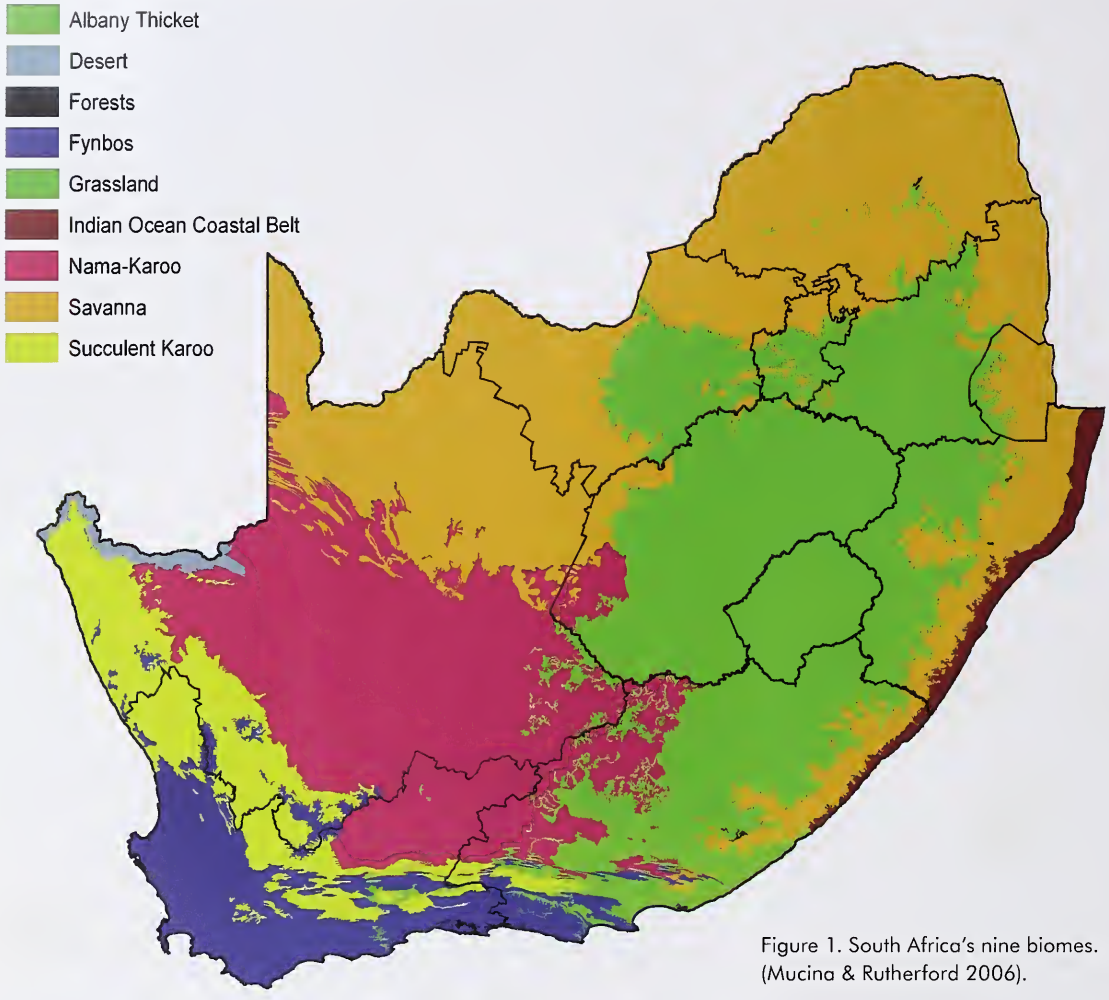


Figure 1. South Africa's nine biomes. (Mucina & Rutherford 2006).

targets have not been set for freshwater ecosystems, biodiversity thresholds for river ecosystems helped to determine the priority areas for land-based protected area expansion, as discussed further below and in Chapter 4.

South Africa has nine biomes, shown in Figure 1, each divided into many vegetation types (from 122 vegetation types in the Fynbos Biome to 15 vegetation types in the Nama-Karoo Biome, with a total of 440 vegetation types altogether) (Mucina & Rutherford 2006). The NPAES has set a 20-year protected area target for each vegetation type in each biome, adding up to the overall land-based 20-year protected area target of 12% of South Africa's total land area. The protected area targets for vegetation types are summarised by biome in Table 2 and by province in Table 3. The last two columns in both tables show the additional area that should be included in the land-based protected area network in the next five years in order to move a quarter of the way towards the combined 20-year targets for vegetation types within the biome concerned.

Table 2 shows clearly that the least protected biomes are Grassland, Nama-Karoo and Succulent Karoo. As will be discussed in Chapter 4, there are still several options in the Nama-Karoo and parts of the Succulent Karoo for meeting protected area targets in a cost-effective way. In contrast, there are fewer choices for meeting protected area targets in Grassland because of many competing land and resource uses, and there is a need to act quickly to secure remaining options. Thus, while Nama-Karoo, Succulent Karoo and Grassland ecosystems are all important for meeting protected area targets, Grassland ecosystems are more urgent.

Table 2. Land-based protected area targets summarised by biome

Biome	Biome area* (000 ha)	20-year PA target (%)	Current protected areas		Still required to meet 20-year vegetation type targets		Required in next 5 years	
			000 ha	%	000 ha	%	000 ha	%
Albany Thicket	2 913	10	211	7	107	3.7	27	0.9
Azonal Vegetation	2 898	14	227	8	282	9.7	71	2.4
Desert	716	18	160	22	96	13.4	24	3.4
Forests	472	23	176	37	8	1.7	2	0.4
Fynbos	8 395	15	1 667	20	669	8.0	167	2.0
Grassland	35 449	14	753	2	4 249	12.0	1 062	3.0
Indian Ocean Coastal Belt	1 428	14	97	7	110	7.7	28	1.9
Nama-Karoo	24 820	11	198	1	2 600	10.5	650	2.6
Savanna	41 266	10	3 803	9	2 442	5.9	610	1.5
Succulent Karoo	8 329	12	435	5	715	8.6	179	2.1

* Biome areas include the portion of the biome that falls within Lesotho or Swaziland where applicable.

Forests, Desert and Fynbos are the best protected biomes. However, the biome-level picture represented in Table 2 disguises significant differences in protection *within* some biomes. The high overall protection level of the Fynbos Biome (20%) hides the fact that while mountain fynbos ecosystems are well protected, the fynbos lowlands are severely under-protected. Savanna and Grassland are less well protected than Fynbos overall, but have similar within-biome differences. The lowveld savannas are well protected by the Kruger National Park and the arid savannas by Kgalagadi TFCA, but the central bushveld savanna areas (largely in central and western Limpopo) are very poorly protected. Similarly, moist Drakensberg grassland vegetation types are reasonably well protected, but highveld grassland types are almost unprotected.

The least protected biomes are Grassland, Nama-Karoo and Succulent Karoo. There are still several options in the Nama-Karoo and parts of the Succulent Karoo for meeting protected area targets in a cost-effective way. In contrast, there are fewer choices for meeting protected area targets in Grassland because of many competing land and resource uses, and there is a need to act quickly to secure remaining options.

In Table 3, the protected area targets for vegetation types are summarised by province.

The key issue highlighted by Table 3 is that the current protected area network does not protect the full range of ecosystems. For example, in Mpumalanga the area currently in protected areas (15%) exceeds the summed protected area targets for vegetation types in the province (13%), yet a significant additional area (8%) still needs to be incorporated in the protected area network over the next 20 years to make it representative of all ecosystems.

In most provinces, around 2% of the province should be incorporated in the land-based protected area network within the next five years in order to move a quarter of the way towards a representative protected area network that meets 20-year protected area targets. Limpopo has the lowest percentage required (1.4% over the next five years), and Free State the highest (3% over the next five years). In all provinces, the expansion should take place in the priority areas for protected area expansion discussed in Chapter 4, with additional detail provided by provincial systematic biodiversity plans where these exist.[15]

The protected area targets in Tables 2 and 3 are based on biodiversity pattern thresholds for vegetation types. They do not tell us about the extent to which other biodiversity features such as ecological processes or threatened species are protected. This means that areas currently protected over

[15]Several provinces have completed provincial systematic biodiversity plans (Gauteng, Mpumalanga, KwaZulu-Natal and Eastern Cape), and several more are under way (North West, Free State and Limpopo). The remaining provinces (Western Cape and Northern Cape) have systematic biodiversity plans for portions of the province, with the intention to move towards provincial biodiversity plans.

Table 3. Land-based protected area targets summarised by province

Province	Province area (000 ha)	20-year PA target (%)	Current protected areas		Still required to meet 20-year vegetation type targets		Required in the next 5 years	
			000 ha	%	000 ha	%	000 ha	%
Eastern Cape	16 893	12	687	4.1	1 570	9.3	393	2.3
Free State	12 983	13	167	1.3	1 581	12.2	395	3.0
Gauteng	1 655	13	84	5.1	152	9.2	38	2.3
KwaZulu-Natal	9 333	13	731	7.8	842	9.0	211	2.3
Limpopo	12 575	11	1 489	11.8	687	5.5	172	1.4
Mpumalanga	7 649	13	1 168	15.3	632	8.3	158	2.1
North West	10 651	11	199	1.9	991	9.3	248	2.3
Northern Cape	37 289	11	1 582	4.2	3 333	8.9	833	2.2
Western Cape	12 945	13	1 632	12.6	1 004	7.8	251	1.9

and above those required to meet protected area targets may nevertheless play an important role in securing biodiversity. The need to focus protected area expansion on under-protected ecosystems remains, preferably choosing areas that also contribute to securing other spatial biodiversity features such as ecological processes. The protected area expansion focus areas discussed in Chapter 4 have been designed to do this.

Specific protected area targets for freshwater ecosystems were not set in this first NPAES. However, biodiversity thresholds for river ecosystems helped to determine the focus areas for land-based protected area expansion (see Chapter 4), so meeting land-based protected area targets in these focus areas will help to increase protection levels of under-protected river ecosystems. In addition, relatively simple changes to the design of land-based protected areas can make a significant difference to the degree of protection they provide for freshwater ecosystems, as highlighted in the box below. The National Freshwater Ecosystem Priority Areas project (NFEPA), currently under way, will identify a national network of freshwater conservation areas and explore mechanisms for implementing them.[16] NFEPA includes a strong focus on wetlands as well as rivers. The results of NFEPA, expected to be completed in mid-2011, will complement this NPAES and will feed into the next NPAES.

We know from the NSBA 2004 that it is difficult to assess meaningfully the current protection levels of freshwater ecosystems, for at least two reasons. Firstly, a substantial proportion of 'protected' river ecosystems are actually the boundaries of protected areas, so they are at best partially protected. Secondly, rivers are linear systems and protected areas are seldom designed in a linear way, raising the question of what proportion of a river ecosystem has to run through a protected area in order for it to be considered protected. Our spatial data on wetland ecosystem types have improved greatly since the NSBA 2004 was conducted, but are not yet complete enough for a meaningful assessment of protection levels of wetland ecosystems. This will be addressed in NFEPA and in the NSBA 2010.

Specific protected area targets for freshwater ecosystems were not set in this NPAES. However, biodiversity thresholds for river ecosystems helped to determine the focus areas for land-based protected area expansion (see Chapter 4). In addition, simple changes to the design of land-based protected areas can make a significant difference to the degree of protection they provide for freshwater ecosystems.

Marine protected area targets

The marine protected area targets summarised in Table 1 are based on underlying targets for marine bioregions, as explained below.

South Africa's mainland EEZ is divided into five inshore marine bioregions and four offshore marine bioregions. Figure 2 shows South Africa's entire EEZ, and Figure 3 shows marine bioregions in the mainland EEZ.

[16]NFEPA is led by SANBI and the CSIR, and is funded by the Water Research Commission with co-funding from the Department of Water Affairs and WWF South Africa. Additional project partners are SANParks, the South African Institute of Aquatic Biodiversity (SAIAB) and DEA.

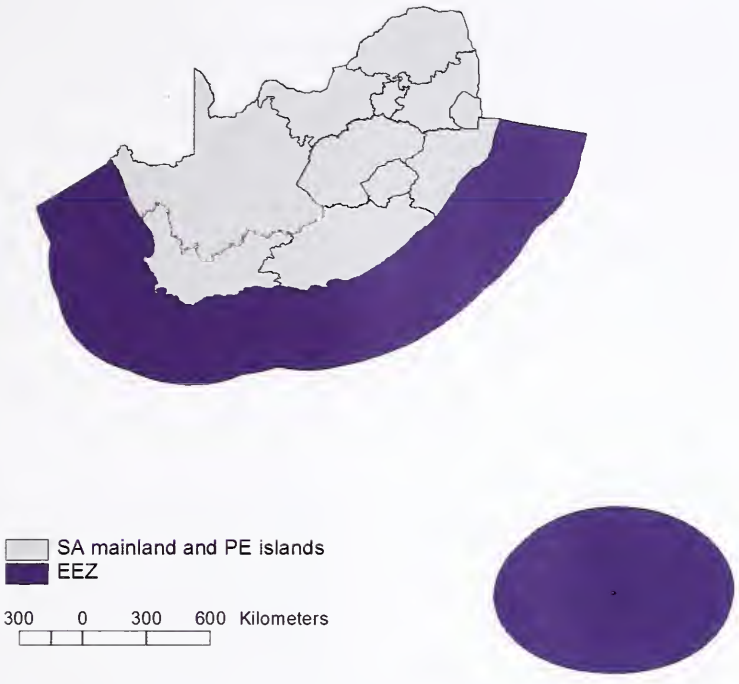


Figure 2. South Africa's marine exclusive economic zone, including the mainland EEZ and the Prince Edward Islands EEZ.

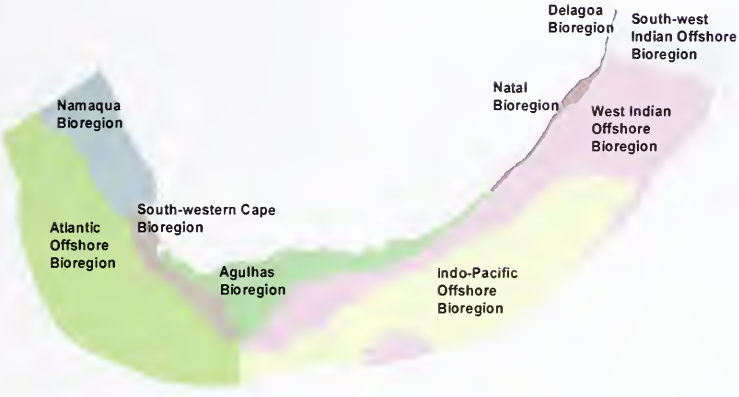


Figure 3. South Africa's marine bioregions.

Table 4 shows protected area targets for inshore marine bioregions. As for the previous tables showing land-based protected area targets, the last set of columns ('Required in next 5 years') shows the increase in protected area extent required to move a quarter of the way from current protected levels to the 20-year target.

The distinction between no-take marine protected areas and other marine protected areas, discussed in Chapter 2, is important for understanding levels of protection and protected area targets in the marine environment. In no-take zones in marine protected areas, currently 9% of South Africa's coastline, fishing and other extractive uses

Designing freshwater-friendly protected areas

Most land-based protected areas are designed to protect terrestrial ecosystems, yet some simple changes could help to make protected areas work better for both freshwater and terrestrial ecosystems:

- Avoid using a river as the boundary of a protected area.
- Encourage expansion of existing protected areas to incorporate whole river reaches that are currently only partially protected. Sometimes this is possible with a relatively modest adjustment to an existing protected area boundary.
- Incorporate natural large-scale catchment processes into protected areas where possible.
- Ensure that rivers are well managed within protected areas, enabling them to recover from the impact of activities upstream as they flow through the protected area.
- Avoid development of visitor infrastructure on priority freshwater ecosystems in protected areas.
- Promote new protected areas for the last remaining free-flowing rivers. There are only 15 remaining free-flowing rivers longer than 100 km in South Africa—all other long rivers have been dammed in some way. Free-flowing rivers helped to determine priority areas for protected area expansion discussed in Chapter 4.

The National Freshwater Ecosystem Priority Areas project (NFEPA), currently under way, will provide more detail on freshwater-friendly protected area design and other priorities for freshwater biodiversity conservation.

Table 4. Protected area targets for inshore marine bioregions

		20-year PA target		Current protected areas				Required to meet 20-year target				Required in next 5 years			
Bioregion	Length	No-take	Total	No-take		Total		No-take		Total		No-take		Total	
	km*	%	%	km	%	km	%	km	%	km	%	km	%	km	%
Namaqua	684	15	25	0	0	0	0	103	15.0	171	25.0	26	3.8	43	6.3
SW Cape	420	15	25	51**	12.1	214	51.0	12	2.9	–	–	3	0.7	–	–
Agulhas	1 706	15	25	197	11.5	275	16.1	59	3.5	152	8.9	15	0.9	38	2.2
Natal	693	15	25	43	6.2	143	20.6	61	8.8	30	4.4	15	2.2	8	1.1
Delagoa	153	15	25	43	28.1	153	100.0	–	–	–	–	–	–	–	–
Total	3 656	15	25	334	9.1	785	21.5	234	6.0	353	9.6	59	1.5	88	2.4

Table notes:

* Inshore marine targets are measured in kilometres of coastline because of the varying distances that inshore MPAs extend from the coastline. Inshore is considered to mean from the high-water mark to the 30 m depth contour. All inshore MPAs extend at least this far. In future we will move towards also using a more accurate area-based measure for inshore MPA targets, but this is not possible with current data.

** This includes the Langebaan Lagoon sanctuary area. Because the Langebaan Lagoon has estuarine characteristics, there is no consensus on whether or not the sanctuary area should count towards meeting marine protected area targets.

of marine resources are not permitted. In contrast, 'controlled' or 'take' zones in marine protected areas can actually become nodes for increased exploitation by allowing recreational and/or subsistence and commercial access, rather than being nodes of protection.

Protected area targets for marine inshore bioregions do not highlight the fact that in all inshore bioregions urgent attention should be given to reducing the impact of recreational activities in the controlled zones within marine protected areas, for example through placing additional restrictions on recreational catches. Currently fishing competitions are even held in some marine protected areas and this matter should be addressed urgently so that such events, if and when allowed, would contribute properly to supplying much needed scientific data. The reduction of extractive use within the controlled zones of marine protected areas could see them becoming 'buffer zones' between no-take and open areas. This can often be achieved without stopping the activities involved altogether, thus maintaining the socio-economic opportunities and benefits associated with the resource.

Table 4 highlights the fact that the Namaqua inshore bioregion is currently entirely unprotected, in either no-take or controlled marine protected areas. It also shows reasonably good overall protection levels for the inshore bioregions except for Namaqua. However, this disguises many gaps in the protection of specific inshore ecosystems and habitats, as inshore bioregions are broad-scale regions (more or less equivalent to terrestrial biomes). For example, although the protected area targets in the South-Western Cape inshore marine bioregion appear to have been achieved, this hides the fact that there are still under-protected ecosystems and habitat types within this bioregion. More detailed analysis is needed to identify these but is not yet possible because of data gaps in marine habitat mapping and classification, as highlighted in Chapter 8 on information gaps and research priorities. As marine habitat mapping and classification advances at a finer scale, ecosystem-based protected area targets will be set for inshore ecosystems and habitats within bioregions, as they have been for vegetation types within terrestrial biomes.

In the Natal inshore bioregion, the increase in no-take protection required in the next five years is greater than the increase in overall protection required in the same period. This means that some of the focus should be on increasing the level of protection within existing marine protected areas in this bioregion from controlled to no-take.

It should be reiterated that the NPAES does not deal with the issue of management effectiveness of protected areas. The Agulhas and Natal inshore bioregions appear to have relatively good levels of protection, but parts of these bioregions are actually currently still vulnerable while pro-

Table 5. Offshore marine protected area targets

		20-year PA target		Current protected areas				Required to meet 20-year target				Required in next 5 years			
	Area	No-take	Total	No-take		Total		No-take		Total		No-take		Total	
	000 km²	%	%	000 km²	%	000 km²	%	000 km²	%	000 km²	%	000 km²	%	000 km²	%
Mainland EEZ	1 072	15	20	1.7	0.16	4.2	0.4	159	14.8	210	19.6	40	3.7	53	4.9
Prince Edward Islands EEZ	467	15	20	0	0	0	0	70	15.0	93	20.0	18	3.8	23	5.0

tected area management capacity is being built up.

The picture for offshore marine protection is considerably different from inshore marine protection, as shown in Table 5. South Africa's offshore marine habitats have almost no protection at all, with none of the Prince Edward Islands EEZ protected, and less than 0.2% of the mainland EEZ in no-take protected areas. For both the mainland and Prince Edward Island EEZ, current levels of protection are so low that the overall offshore protected area targets apply essentially equally to each offshore bioregion. A strategy to increase protection in offshore marine protected areas while minimising negative impacts on commercial fisheries, and indeed providing benefits where possible, is being developed (Sink & Attwood 2008).

To summarise, the focus for marine protected area expansion in the next five years should be predominantly on offshore marine protected areas and the Namaqua inshore bioregion. For inshore bioregions other than Namaqua, there is a need to increase the extent of no-take zones within existing marine protected areas, and to reduce the impact of exploitation in controlled zones within marine protected areas. In the longer term for inshore marine bioregions there is a need to improve representation of the full range of marine habitats in marine protected areas. More guidance will be possible on this as mapping and classification of marine habitats improves.

The focus for marine protected area expansion in the next five years should be predominantly on offshore marine protected areas and the Namaqua inshore bioregion. In addition, there is a need to increase the extent of no-take zones within existing marine protected areas, and to reduce the impact of exploitation in controlled zones within marine protected areas.

4. Priority areas for protected area expansion

CHAPTER SUMMARY

Having set protected area targets, the next step is to determine which geographic areas are the highest priorities for protected area expansion to meet those targets. The NPAES uses two factors, importance and urgency, to identify priority areas for protected area expansion. An area is considered important for the expansion of the land-based protected area network if it contributes to meeting biodiversity thresholds for terrestrial or freshwater ecosystems, maintaining ecological processes or climate change resilience, or a combination of these. Using systematic biodiversity planning techniques, the NPAES identified 42 focus areas for land-based protected area expansion (Figure 7). These are large, intact and unfragmented areas suitable for the creation or expansion of large protected areas. In addition to the focus areas, threatened ecosystems are also important for protected area expansion. Urgency is determined by the extent to which spatial options for meeting protected area targets still exist, which is often linked to the degree of competing land or resource uses in an area, which in turn often correlates with land prices.

Importance and urgency can be illustrated on a graph or matrix divided into four quadrants (Figure 9). Quadrant 1 areas, those that are important and urgent, may seem like the obvious place to focus expansion efforts. However, if we focus only on the areas that are important and urgent, we lose opportunities to secure protected areas where there are currently fewer competing land and resource uses. Protected area expansion is often most cost effective in Quadrant 2, the important but not (yet) urgent areas. This is where, rand for rand, most can be achieved in terms of meeting biodiversity thresholds and contributing to ecological sustainability. As landscapes become fragmented, we are rapidly losing the ability to create large protected areas, which are especially important for resilience to climate change. It is important to grasp opportunities to create viable large protected areas in currently intact landscapes. Protected area agencies should aim for a balanced portfolio of expansion activities in Quadrants 1 and 2, both of which contribute to biodiversity conservation and ecological sustainability.

Having set targets for protected area expansion, the next step is to determine where in the landscape and seascape those targets should best be achieved: which geographic areas should be the focus for expanding the protected area network?

The spatial analysis for the NPAES was undertaken for land-based protected areas, incorporating a significant focus on meeting freshwater as well as terrestrial biodiversity thresholds. As with much biodiversity planning work in South Africa, the spatial analysis for the NPAES was scientifically innovative, representing internationally significant advances in the growing field of biodiversity planning. It is described in greater detail in the NPAES Resource Document and in Holness *et al.* (in prep.).

For the marine environment, data and time constraints meant that the NPAES had to rely on work done previously for the NSBA 2004 (Lombard *et al.* 2004) and a biodiversity planning project for the Prince Edward Islands EEZ (Lombard *et al.* 2007). SANBI, DEA and WWF-SA are currently leading an Offshore Marine Protected Area Project that includes spatial analysis of priority areas for the offshore marine protected area network. Once the project is completed, the spatial priorities it identifies will supersede those presented here for the offshore marine environment. Future revisions of the NPAES will include a stronger focus on spatial analysis for the marine environment, both inshore and offshore.

The NPAES uses two factors, importance and urgency, to determine which geographic areas are the highest priorities for protected area expansion. Below we explain first how importance was assessed using systematic biodiversity planning methods to produce a map of focus areas for land-based protected area expansion, and then how urgency can be assessed for these focus areas. Lastly we combine importance and urgency using a matrix approach to provide a framework for determining priorities for protected area expansion.

Importance

In the NPAES, an area is considered important for the expansion of the land-based protected area network if it contributes to one or more of the following:

- meeting biodiversity thresholds for terrestrial or freshwater ecosystems,
- maintaining ecological processes,
- resilience to climate change.

Importance was assessed using systematic biodiversity planning

techniques and biodiversity planning software to determine which geographic areas make the biggest contributions to biodiversity thresholds, ecological processes and resilience to climate change.

Biodiversity pattern thresholds were set for vegetation types and river types. Spatial aspects of ecological processes included in the analysis included climate and landscape heterogeneity (based on altitude, temperature and rainfall variability), habitat heterogeneity, coastal ecological processes, and river-associated movement corridors (varying in width from 1 km in heavily used landscapes to 10 km in natural areas). Some of the layers relating to ecological processes and resilience to climate change used in the spatial analysis are shown in Figure 4. Additional factors that were taken into account included proximity to existing protected areas, presence of threatened ecosystems, priorities identified in previously completed systematic biodiversity plans, and the need to avoid highly fragmented natural habitat where possible.

Areas important for freshwater representation and persistence were determined based on a representative sample of river types and endemic fish in intact rivers, connectivity between representative river sections, free-flowing rivers (important for riverine and estuarine processes), and intact river systems supporting priority estuaries.[17] These areas, shown in Figure 5, informed the analysis of importance for land-based protected area expansion.

The overall results of the spatial analysis are shown in Figures 6 and 7. Figure 6 shows areas that are important for land-based protected area expansion, based on all the factors mentioned above. Figure 7 shows a subset of these important areas, selecting the most important areas and excluding fragments of natural habitat smaller than 5 000 hectares. The areas shown in Figure 7 are large, intact and unfragmented areas suitable for the creation or expansion of large protected areas. We have called them ***focus areas for land-based protected area expansion***.

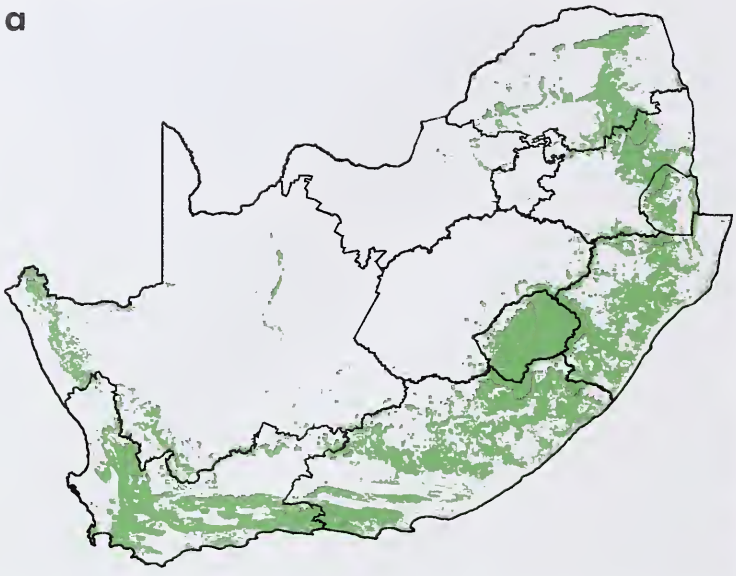
In addition to these focus areas for protected area expansion, threatened ecosystems identified in the NSBA or listed in terms of the Biodiversity Act are also important for protected area expansion. Threatened ecosystems are often highly fragmented and thus not suitable for the creation or expansion of large protected areas, but contractual protected areas through biodiversity stewardship programmes (see Chapter 5) can play a crucial role in protecting remaining natural habitat in threatened ecosystems.

The NPAES identifies 42 focus areas for land-based protected area expansion. These are large, intact and unfragmented areas suitable for the creation or expansion of large protected areas.

There are 42 focus areas, which have been given numbers and names. Some of the focus areas are described briefly below to highlight their contributions to ecological sustainability and climate change resilience. The focus areas singled out for description are not more important than the others, but simply used as examples.

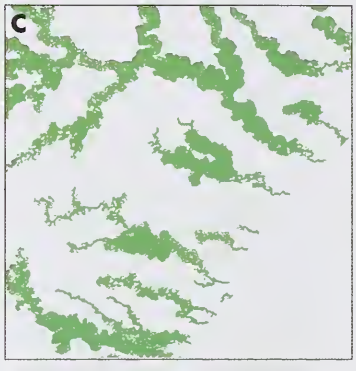
The **Kamiesberg Bushmanland Augrabies focus area (#15)** in the Northern Cape represents the largest remaining natural area for the expansion of the protected area network and forms part of the planned Lower Orange River TFCA. It provides an opportunity to protect 22 Desert and Succulent Karoo vegetation types, mostly completely unprotected, several river types that are still intact but not protected, and important ecological gradients and centres of endemism. Sub-catchments should be

[17]As determined in the estuarine conservation plans mentioned earlier (Turpie & Clark 2007) for temperate estuories and Ezemvelo KZN Wildlife's conservotion plan for KZN estuaries (plan completed, report forthcoming).



Areas of high climate and landscape variation are likely to be resilient to climate change. These are areas where climate is likely to be more stable over time, providing refugia where plants and animals can persist.

An example of **coastal ecological processes**, which need to be kept intact to maintain the resilience of coastal settlements to extreme climate events, to buffer inland ecosystems, and to support inshore marine ecosystem functioning and sustainability of inshore fisheries.



River-associated movement corridors provide critical ecological linkages between large patches of intact natural habitat, especially through heavily impacted agricultural and urban landscapes. They are important for movement of animals such as pollinators and predators in the short term, and for genetic interchange and migration of plants and animal species in the medium and long term. They also provide linkages between uplands and lowlands.

Figure 4 a, b and c. Selected ecological process layers that contributed to the analysis of importance for land-based protected area expansion.

used to delineate protected areas in this focus area, to incorporate whole river reaches. There may be opportunities for expanding protected areas in partnership with NGO funders and the mining industry.

The **Pondoland focus area (#31)** in the Eastern Cape represents the last opportunity for a large coastal protected area in South Africa, with the attendant opportunities for local and regional economic development linked to coastal ecotourism. It has a remarkable spread of vegetation types across five biomes, including some unique mosaics of coastal grassland and forest, and provides opportunities to maintain large catchment-scale ecological processes in the form of free-flowing rivers (of which few remain in South Africa) and intact rivers linked to priority estuaries. There are opportunities to consolidate the Mkambati Nature Reserve and the Pondoland State Forests.

The **Baviaans-Addo focus area (#3)** in the Eastern Cape includes vegetation types from no less than seven biomes and is an extremely important area for conserving ecological processes that support resilience to climate change. It also presents excellent opportunities for incorporating whole river reaches and irreplaceable river types in protected areas. There are opportunities for expanding the World Heritage Site-listed Baviaanskloof Megareserve, Groendal Nature Reserve and Addo Elephant National Park.

The **Southern Berg Griqualand focus area (#34)** in the Eastern Cape represents one of the few opportunities for large formal protected areas in the highly threatened Grassland Biome, and contains some of the few examples left of inland free-flowing rivers. It was also identified as a key national priority in the Maloti-Drakensberg and Grasslands systematic biodiversity plans.

The **Free State Highveld Grasslands focus area (#12)** includes some of the last remaining opportunities for relatively large protected areas in the highly threatened Grassland

Biome, as well as the opportunity to incorporate intact river reaches and a number of threatened river types. Options for meeting protected area targets are retreating rapidly in this area, making protected area expansion urgent (see the next section for further discussion on urgency).

The **Drakensberg and Midlands focus area (#9)** in KwaZulu-Natal provides opportunities for consolidating protection of moist high-altitude grasslands, protecting ecosystem services, and incorporating ecological gradients for resilience to climate change. It is the source area for several free-flowing rivers and includes critically endangered river types.

The **Knersvlakte Hantam focus area (#18)**, which straddles the Western Cape and Northern Cape, is a spectacular Succulent Karoo priority area (also identified as a national and international priority by SKEP). It contains numerous irreplaceable quartz patches, and provides opportunities to protect whole intact river reaches. This reinforces the importance of the current expansion of the Knersvlakte Nature Reserve.

The **Tankwa Cederberg Roggeveld focus area (#36)**, which straddles the Western Cape and the Northern Cape, is exceptionally important from a freshwater biodiversity point of view. It includes a large portion of the important Doring River, the third largest free-flowing river in the country, which plays a crucial economic role in sustaining the high levels of utilisation of the Olifants River and meeting the water requirements of the Olifants estuary. In addition, it presents opportunities for protecting several threatened river types and important fish sanctuary areas that harbour endemic and threatened freshwater fish.

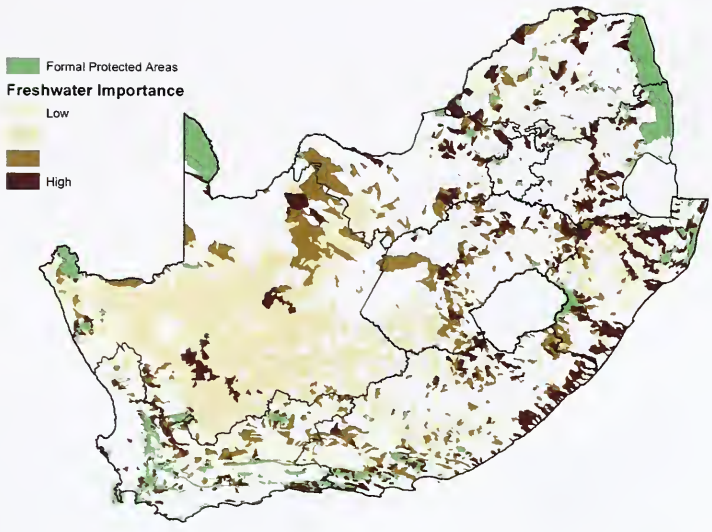


Figure 5. Areas important for freshwater representation and persistence, which informed the analysis of overall importance for land-based protected area expansion.

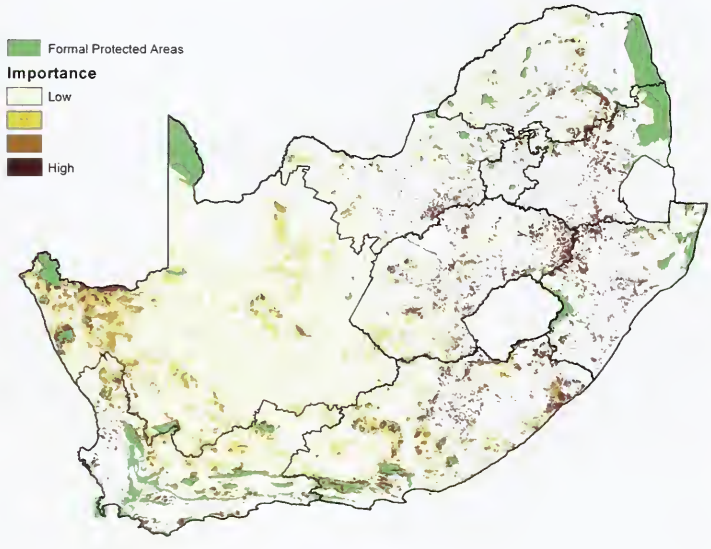


Figure 6. Importance for land-based protected area expansion.

The **Vaal Grasslands focus area (#39)**, which straddles Gauteng and North West, includes the last remaining unfragmented areas of dry highveld grasslands.

The **Northeast Escarpment focus area (#29)** in Limpopo is an extremely diverse area important for ecological processes and resilience to climate change. It is an important Grassland centre of endemism and includes opportunities for protecting intact river reaches with threatened river types. There are excellent opportunities for expanding the Legalametse, Wolkberg and Blyde Canyon Reserves.

The **Mpumalanga Mesic Grasslands focus area (#27)** represents opportunities to con-

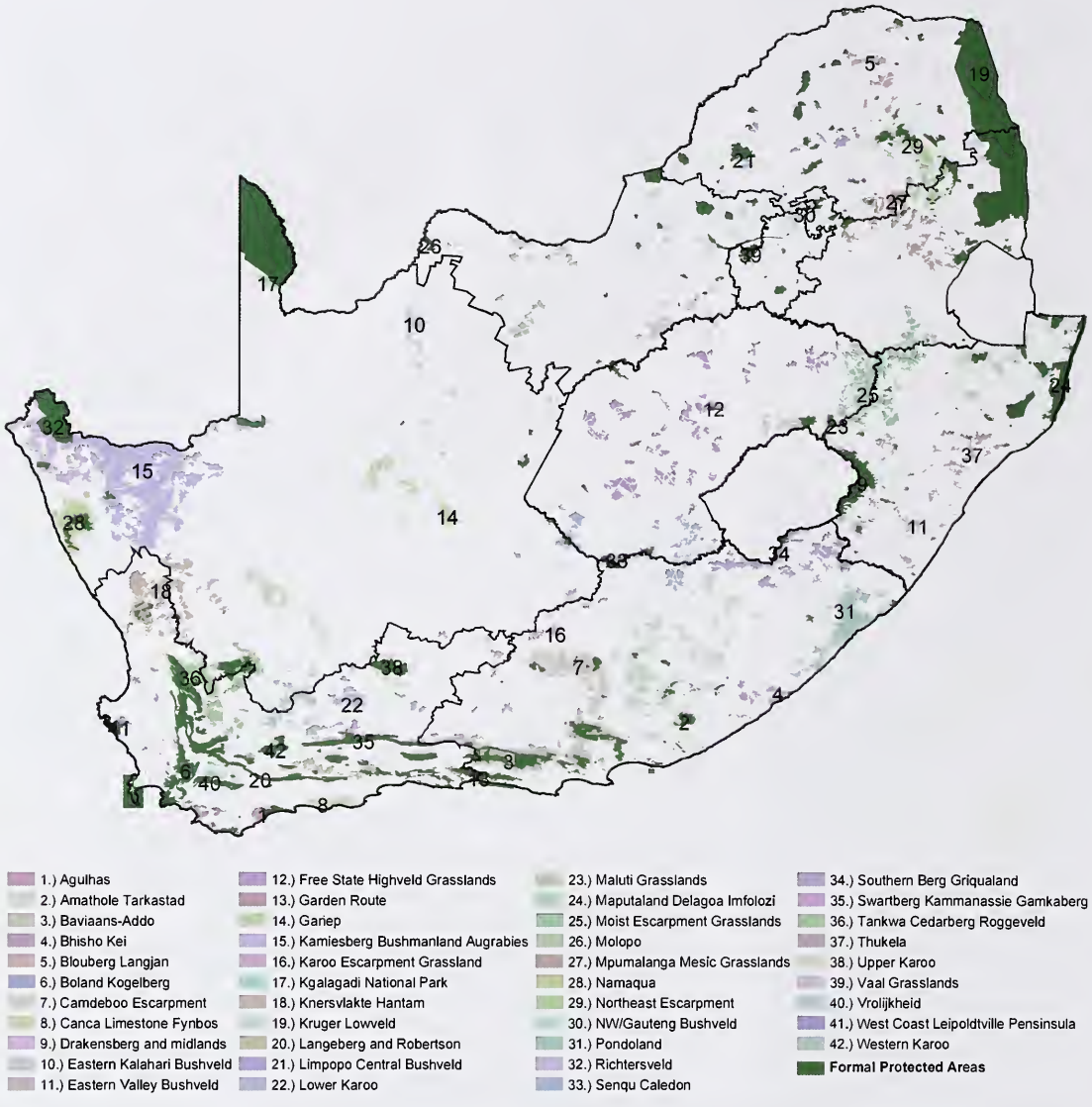


Figure 7. Focus areas for land-based protected area expansion (large, intact and unfragmented areas of high importance, suitable for the creation or expansion of large protected areas).

serve poorly protected grassland and bushveld vegetation types as well as whole river reaches and threatened river types. It was also identified as a national priority in the Grasslands systematic biodiversity plan.

In the marine environment, the most important areas for protected area expansion have been identified as the Namaqua inshore and offshore areas, the Agulhas Bank and the Prince Edward Islands EEZ, as shown in Figure 8. As discussed earlier, this assessment was based on previous work (Lombard *et al.* 2004; Lombard *et al.* 2007). The SANBI-DEA-WWF Offshore Marine Protected Area Project will identify more detailed priority areas for offshore marine protected area expansion and, once completed, will supersede the priorities presented in Figure 8. In addition, more detailed biodiversity planning has been undertaken in some marine bioregions, for example the Agulhas bioregion (Clark & Lombard 2007), and should be used to provide additional guidance at a finer scale.

Urgency

Having assessed importance for protected area expansion (Figures 6 and 8) and having identified a

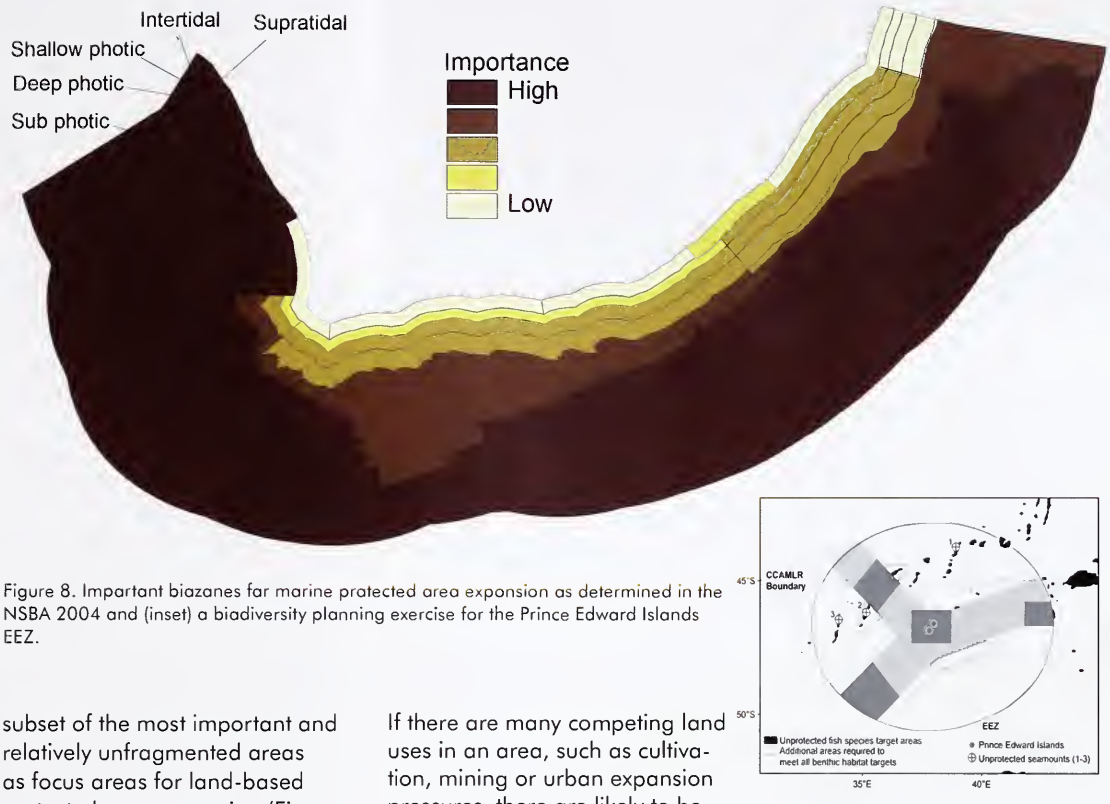


Figure 8. Important biozones for marine protected area expansion as determined in the NSBA 2004 and (inset) a biodiversity planning exercise for the Prince Edward Islands EEZ.

subset of the most important and relatively unfragmented areas as focus areas for land-based protected area expansion (Figure 7), we move on to looking at how urgently these focus areas should be addressed.

For protected area expansion, urgency is determined by the extent to which spatial options for meeting protected area targets still exist. If there are several places in the landscape where the target for a particular vegetation type can be met, then spatial options still exist. However, if so little of this ecosystem is left intact that there are only one or two places where the protected areas target can be met, then the spatial options are few and protected area expansion is more urgent. The extent to which options still exist is often linked to the degree of competing land or resource uses in an area, which in turn often correlates with land prices in the terrestrial environment.

If there are many competing land uses in an area, such as cultivation, mining or urban expansion pressures, there are likely to be few large intact areas of natural habitat where protected area targets can still be met. In such a case, options for meeting protected area targets are limited and the urgency of protected area expansion is high. It is important to secure the last remaining areas suitable for meeting protected area targets while they still exist. However, it is also likely that land prices will be high, making it more difficult to secure sites in the protected area network. This is usually the case in biomes such as Grassland and Fynbos lowlands, which provide opportunities for many highly profitable land uses other than conservation.

For protected area expansion, urgency is determined by the extent to which spatial options for meeting protected area targets still exist. This is often linked to the degree of competing land or resource uses in an area, which in turn often correlates with land prices in the terrestrial environment.

In contrast, in areas where there are fewer competing land uses and some of them are compatible with biodiversity conservation (such as appropriately managed grazing or game farming), there are likely to be more spatial options available for meeting protected area targets and thus lower levels of urgency for secur-

ing protected areas immediately. Land prices are also likely to be lower, making protected area expansion in these areas easier. This tends to be the case in arid biomes such as Nama-Karoo and Succulent Karoo (with exceptions in some ecosystems within these biomes, for example Succulent Karoo quartz patches in which there are significant competing land uses, notably mining).

A spatial assessment of urgency at the level of vegetation groups shows that the following are critically urgent for protected area expansion: alluvial vegetation; West Strandveld, East Coast Renosterveld and West Coast Renosterveld in the Fynbos Biome; Sub-Escarpment Grassland in the Grassland Biome; and Sub-Escarpment Savanna in the Savanna Biome. Very urgent vegetation groups for protected area expansion are: freshwater wetlands and seashore vegetation; Southern Namib Desert in the Desert Biome; South Strandveld, South Coast Fynbos, Eastern Fynbos-Renosterveld, South West Fynbos in the Fynbos Biome; Dry Highveld Grassland, Mesic Highveld Grassland in the Grassland Biome; and the Indian Ocean Coastal Belt.

At the level of the focus areas for land-based protected area expansion (Figure 7), urgency is best assessed by protected area agencies familiar with the land and resource use pressures in the area concerned. However, in general, the focus areas that include the critically urgent and very urgent vegetation groups listed above are likely to have few remaining options for meeting protected area targets and are therefore likely to be most urgent.

In the marine environment, spatial data on competing resource uses are limited, as highlighted in Chapter 8, making a systematic assessment of levels of urgency difficult. However, an initial expert-based assessment in the NSBA 2004 suggested highest levels of competing resource uses and therefore greatest urgency in the Namaqua and South-Western Cape bioregions, followed by the Agulhas and Natal bioregions.

Priorities, based on importance and urgency

How do importance and urgency help to determine priorities for protected area expansion? It is not as simple as saying that the most important and most urgent areas are the highest priorities for action. Counter-intuitively, priorities may lie in areas that are important but not urgent, as explained below.[18]

Importance and urgency can be illustrated on a graph or matrix as shown in Figure 9, divided into four quadrants. Quadrant 1 represents areas that are both important (make a large contribution to meeting biodiversity thresholds for representation and persistence) and urgent (few spatial options remain for meeting protected area targets). Quadrant 2 represents areas that are important but not urgent. Quadrant 3 represents areas that are neither important nor urgent. Quadrant 4 represents areas that are urgent but not important (few options for meeting protected area targets, but these areas do not contribute much to biodiversity thresholds so this is not of great concern).

Quadrant 1 areas, those that are important and urgent, may seem like the obvious place to focus expansion efforts. However, if we focus only on the areas that are important *and* urgent, we lose opportunities to secure protected areas where there are currently fewer competing land and resource uses. Quadrant 1 areas are likely to be the most expensive and/or difficult to secure, and can absorb a great deal of the protected area expansion effort for not much gain in terms of contributing to biodiversity thresholds. Meanwhile, in areas that are currently not urgent, options for meeting protected area targets may be retreating. It can be more effective to secure low urgency areas now, before their urgency status changes as a result of changing patterns of land and resource use.

Further, as landscapes become fragmented, we are rapidly losing the ability to create large protected areas, which are especially important for adaptation to climate change. It is important to grasp opportunities to create viable large protected areas in currently intact landscapes—these are likely to fall in Quadrant 2. Protected area expansion in Quadrant 2 might be characterised as prevention rather than cure, which does not negate the need for cure in acute circumstances.

[18]Readers familiar with Stephen Covey's well known book, *The seven habits of highly effective people*, first published in 1989, will recognise this approach. Covey uses an importance/urgency matrix as a time management tool, arguing that one of the keys to effective time management and productivity is to focus not only on tasks that are both important and urgent but also on those that are important but not urgent – the so-called Quadrant 2 tasks. The importance-urgency matrix is also similar to the 'irreplaceability-vulnerability' approach traditionally used by conservation planners, but does not lead to the traditional conclusion that high irreplaceability–high vulnerability features are necessarily the highest priority.

As landscapes become fragmented, we are rapidly losing the ability to create large protected areas, which are especially important for adaptation to climate change. It is important to grasp opportunities to create viable large protected areas in currently intact landscapes.

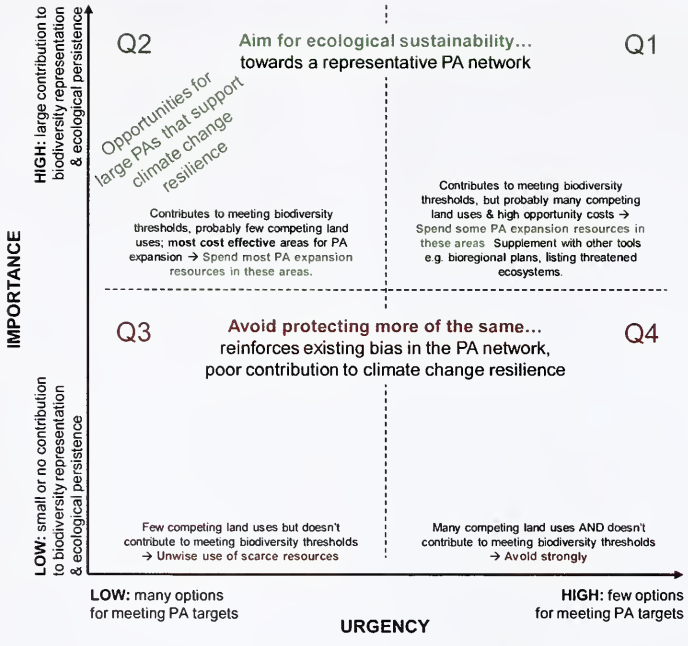

Q2
Aim for ecological sustainability...
towards a representative PA network
Q1
Opportunities for large PAs that support climate change resilience
Contributes to meeting biodiversity thresholds, probably few competing land uses; most cost effective areas for PA expansion → Spend most PA expansion resources in these areas.
Contributes to meeting biodiversity thresholds, but probably many competing land uses & high opportunity costs → Spend some PA expansion resources in these areas Supplement with other tools e.g. bioregional plans, listing threatened ecosystems.
Q3
Avoid protecting more of the same...
reinforces existing bias in the PA network,
poor contribution to climate change resilience
Q4
Few competing land uses but doesn't contribute to meeting biodiversity thresholds → Unwise use of scarce resources
Many competing land uses AND doesn't contribute to meeting biodiversity thresholds → Avoid strongly
HIGH: large contribution to biodiversity representation & ecological persistence
LOW: small or no contribution to biodiversity representation & ecological persistence
IMPORTANCE
LOW: many options for meeting PA targets
HIGH: few options for meeting PA targets
URGENCY

Figure 9. Priority oreos for protected area expansion are identified on the bosis of importonce and urgency.

Protected area expansion is therefore often most cost effective in Quadrant 2, the important but not (yet) urgent areas. This is where, rand for rand, most can be achieved in terms of meeting biodiversity thresholds and contributing to ecological sustainability. This is not to say that Quadrant 1 areas should be ignored or excluded, but rather that careful choices have to be made about where to focus protected area expansion effort, taking into account relative costs and benefits in terms of meeting protected area targets. Other tools for biodiversity conservation, such as bioregional plans and listing of threatened ecosystems, are important for biodiversity conservation in Quadrant 1 areas and may be more cost effective than protected areas in this context (although they ultimately provide less security than protected areas).

It goes almost without saying that to focus protected area expansion effort on areas in Quadrant 3 or 4 is not recommended. In Quadrant 3 there may well be tempting low-cost opportunities for expanding the protected area network, but with small or no benefits in terms of contributing to biodiversity thresholds. In Quadrant 4, costs of protected area expansion are likely to be high, and benefits few—these are clearly areas to avoid. Protected area expansion in Quadrant 3 and 4 areas would likely reinforce existing biases in the protected area network. There are selected cases in which management factors may mean that it makes sense to consider expansion in Quadrant 3 or 4 areas, chiefly when the resulting profits or reductions in management costs would be greater than the cost of expansion incurred by protected area agencies.

Protected area agencies should aim for a balanced portfolio of expansion activities in Quadrants 1 and 2, both of which contribute to biodiversity conservation and ecological sustainability, and should avoid reinforcing existing biases in the protected area network by protecting 'more of the same' in Quadrants 3 and 4.

Protected area expansion is often most cost effective in Quadrant 2, the important but not (yet) urgent areas. This is where, rand for rand, most can be achieved in terms of meeting biodiversity thresholds and contributing to ecological sustainability.

Protected area agencies should aim for a balanced portfolio of expansion activities in Quadrants 1 and 2, both of which contribute to biodiversity conservation and ecological sustainability, and should avoid reinforcing existing biases in the protected area network by protecting 'more of the same' in Quadrants 3 and 4.

5. Mechanisms for protected area expansion

CHAPTER SUMMARY

There are three main mechanisms for expanding the land-based protected area network: acquisition of land, contract agreements, and declaration of public land. Each one has an important role to play, with contract agreements being increasingly used.

Acquisition of land, the traditional way of establishing and expanding protected areas, involves large upfront costs and is usually used most appropriately in Quadrant 2 expansion.

Contract agreements, in which landowners maintain ownership of their land but enter into a contract with a protected area agency in return for formal protected area status, are facilitated by provisions of the Protected Areas Act. They are appropriate for Quadrant 1 or 2 expansion, and are being increasingly used as part of **biodiversity stewardship programmes**. Contract agreements are attractive because they tend to cost protected area agencies less than acquisition, and because by far the largest proportion of land in the focus areas for protected area expansion is in private hands. Biodiversity stewardship programmes should be strengthened so that more use can be made of contract agreements in the expansion of the protected area network. There are significant potential synergies between stewardship programmes, land reform and rural development.

Declaration of public or state land involves reassigning land to a protected area agency from another organ of state, and is appropriate for Quadrant 1 or 2 expansion. It has limited applicability because only a small proportion of land in the focus areas for protected area expansion is public land.

Having identified priority areas for protected area expansion, we now look at mechanisms for expanding the protected area network in those priority areas. There are three main mechanisms for expanding existing land-based protected areas or establishing new ones:

- acquisition of land,
- contract agreements, including through biodiversity stewardship programmes,
- declaration of state or public land.

Expansion of the marine protected area network is more complex. Marine protected areas are declared in terms of the Marine Living Resources Act. For offshore marine protected areas, no private property rights are involved but there are mining rights, medium- and long-term fishing rights with annual quotas, and rights of access at sea that have to be modified, rescinded or expropriated in order to establish a marine protected area. Mechanisms for achieving this are currently unclear and need to be explored. The SANBI-DEA-WWF Offshore Marine Protected Area Project is working on this, but additional legal investigation is likely to be required.

Likewise in the freshwater environment, mechanisms for securing protected areas specifically focused on freshwater ecosystems may be different from those used for land-based protected areas in general. The NFEPA project, mentioned earlier, will include a focus on institutional and legal mechanisms for securing a network of freshwater conservation areas, to complement existing mechanisms for securing land-based protected areas.

The focus in this chapter is on mechanisms for expanding the land-based protected area network. Contract agreements are increasingly used and have potential for even greater use as provincial biodiversity stewardship programmes are strengthened and implemented. Nevertheless, acquisition of land and declaration of public land remain appropriate and important mechanisms for protected area expansion in some circumstances. Each of the three mechanisms is discussed briefly below. More detail is available in the NPAES Resource Document.

Acquisition of land

Acquisition of land through purchase is the traditional mechanism for expanding the protected area network. Land is bought up by protected area agencies, either for inclusion in existing protected areas or to establish a new protected area. Acquisition is the most secure option for protected area expansion, but also usually the most costly. It is usually used most appropriately for Quadrant 2 expansion (see Chapter 4).

Because acquisition is the mechanism that has been used most in the establishment of the land-based protected area network to date, it would be easy to continue to rely on it as the primary mechanism for expanding the protected area network. However,

it will not be possible to meet protected area targets using acquisition alone—the cost would simply be too high. Based on land price data from 2005 to 2007, the estimated cost of purchasing the land needed to meet all 20-year land-based protected area targets would be R23 billion.[19] Although this would arguably be a good national investment in climate change adaptation, it is nevertheless a prohibitive cost for protected area agencies. (See Chapter 6 for further discussion on financial mechanisms for protected area expansion.)

Contract agreements, including through biodiversity stewardship programmes

Contractual arrangements for expanding national parks were made possible by the National Parks Act (Act 57 of 1976) and have been used by SANParks especially from the late 1980s onwards. The Protected Areas Act has made it possible for contract agreements to be used in a wider range of contexts since 2003, including by provincial protected area agencies. In this mechanism, the land concerned remains in private hands, with a formal contract between the landowner and a protected area agency. The landowner agrees to restrictions on use of the land and the protected area agency commits to various forms of assistance with management. In the most secure cases, restrictions on use of the land are written into the title deed and thus remain in place if the land changes hands. The landowner of such a contractual protected area is eligible for exclusion from property rates in terms of the Municipal Property Rates Act (Act 6 of 2004).

Contract agreements in terms of the Protected Areas Act are the most secure of a series of options for agreements with landowners that form part of biodiversity stewardship programmes. The less secure options require the landowner to agree to fewer restrictions and come with less ongoing management assistance from the protected area agency. They are also not recognised in terms of the Protected Areas Act and therefore do not constitute formal protected areas. These informal conservation area arrangements can be useful as 'entry-level' biodiversity stewardship agreements, and over time may lead to contract agreements. Existing conservation areas (see definition on page 9) can also provide a useful starting point for pursuing contract agreements, as long as they fall within important areas for protected area expansion (Quadrants 1 and 2).

CapeNature in the Western Cape pioneered a provincial biodiversity stewardship programme that has provided many valuable lessons for biodiversity stewardship programmes in other provincial protected area agencies, nota-

Acquisition of land through purchase is the traditional mechanism for expanding the protected area network. However, it is not possible to meet protected area targets using acquisition alone—the cost would simply be too high. This makes other mechanisms for protected area expansion, especially contract agreements, all the more important.

Contract agreements involve formal contracts between landowners and protected area agencies, in which the landowner agrees to restrictions on the use of the land and the protected area agency commits to various forms of assistance with management. Contract agreements are a key mechanism for expanding the protected area network. They are often much more cost effective than acquisition of land, and are increasingly used as part of biodiversity stewardship programmes.

[19]This compares to a Gautrain cost of approximately R25.5 billion and is approximately 1% of South Africa's GDP.

bly Ezemvelo KZN Wildlife and more recently the Northern Cape Department of Tourism, Environment and Conservation.[20] More provinces are in the process of initiating biodiversity stewardship programmes, and a national biodiversity stewardship policy document and guideline document are being developed.

Contract agreements need not be used only where land is in private ownership. As discussed in Chapter 2, the Richtersveld National Park, the Makuleke section of the Kruger National Park and iSimangaliso Wetland Park provide good examples of community ownership of formal protected areas through contract agreements. Several community stewardship agreements are under negotiation in other parts of the country. There are significant potential synergies between land reform, contract agreements for protected areas, and biodiversity stewardship programmes more broadly, as discussed in Chapter 2.

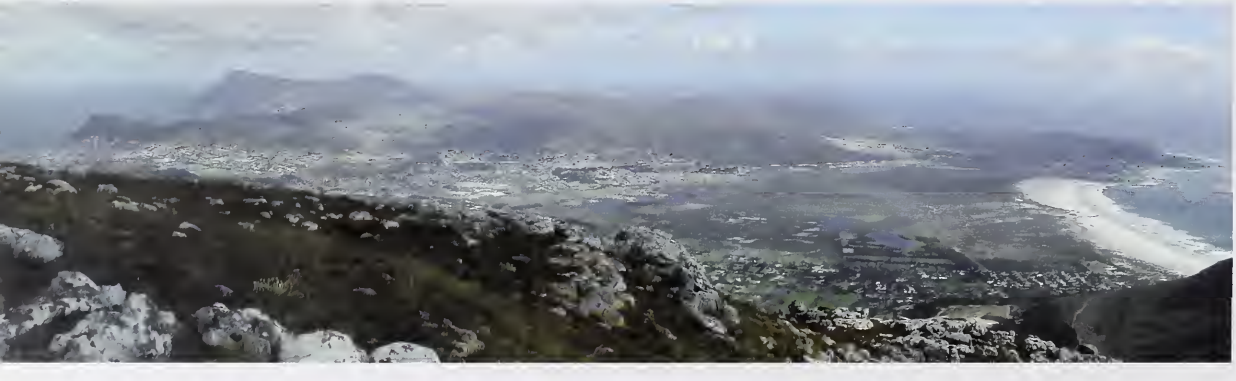
Contractual protected areas can involve substantial costs during the process of negotiating the contract, and require ongoing resources from the protected area agency to support the landowner in managing the property concerned. Nevertheless, the overall cost of contractual protected areas tends to be substantially less than the cost of acquisition. This makes them an attractive mechanism for protected area expansion in many circumstances, especially for Quadrant 1 expansion where land prices may be prohibitive. In Quadrant 2 a range of factors will determine whether acquisition or a contractual protected area is the most appropriate option in a particular case.

Protected area agencies wishing to establish biodiversity stewardship programmes should develop a basket of incentives that can be offered to landowners in return for entering into contract agreements, over and above the existing exclusion from municipal property rates and the new income tax incentives that support the establishment of contractual protected areas (see Chapter 6). Additional incentives that can be combined to suit landowner preferences include, for example, support and advice on technical and professional planning and operations, fire management services, assistance with clearing invasive alien plants, advice on sustainable harvesting of natural resources, partnerships in nature-based commercial ventures, access to marketing resources, access to expensive game-fencing supply, and enforcement support.

Declaration of public or state land

Declaration of public or state land involves reassigning the management of public or state land from a national or provincial government department to a protected area agency. Where land in focus areas for protected area expansion is held by the state (for example, Department of Public Works, South African National Defence Force) or by parastatal agencies (for example, ESKOM), such land should be identified and where possible management of the land should be assigned to a protected area agency.

Declaration of public or state land is appropriate for Quadrant 1 and Quadrant 2 expansion. This mechanism has limited usefulness as a very small proportion of land in the protected area expansion focus areas is held by the state.[21] However, where it is possible to use this mechanism, it may be very cost effective.



[20]CapeNature has developed a *Stewardship Operational Procedures Manual* (2007), and Ezemvelo KZN Wildlife has a *Biodiversity Stewardship Operations Manual* (2008), available at www.kznwildlife.com/site/conservation_planning/stewardship/.

[21]Initial calculations indicate that 4% of land in the focus areas for protected area expansion is state land. Figure not confirmed.

6. Financial tools for protected area expansion

CHAPTER SUMMARY

Protected area expansion draws on several sources of finance, all of which have an important role to play given the size of the task of achieving protected area targets. The new fiscal incentives contained in the Revenue Laws Amendment Act (Act 60 of 2008) are likely to provide a significant boost to protected area expansion by making defined conservation management costs tax deductible for landowners who have entered into a contract agreement. Additional biodiversity-related fiscal reform options being explored include reducing the transaction costs associated with land acquisition for protected areas, removing perverse incentives in municipal property rates, and using Expanded Public Works Programme funding as an incentive to encourage landowners to enter into contract agreements. Innovative financial mechanisms that should be piloted include a revolving land fund, and payments for ecosystem services in cases where protected areas contribute to, for example, catchment management and water supply.

Protected area expansion draws on several sources of finance, all of which have an important role to play given the size of the task of achieving protected area targets:

- funding from National Treasury,
- donor funding, particularly for land acquisition,
- revenues earned from protected areas,
- biodiversity-related fiscal reform to facilitate investment and expenditure by private landowners through contract agreements.

We noted in Chapter 5 that, based on land price data from 2005 to 2007, the estimated cost of purchasing the land needed to meet all 20-year land-based protected area targets would be R23 billion. Although this would arguably be a good national investment in climate change adaptation, it is nevertheless a prohibitive cost for protected area agencies, highlighting the importance of biodiversity-related fiscal reform to support contract agreements and of other innovative financial mechanisms for protected area expansion. New financial mechanisms that should be piloted include:

- **A revolving land fund**, which could be piloted by a public benefit organisation, initially in one biome or region. An initial feasibility assessment (Owen 2005) contains recommendations about the establishment of a revolving land fund in South Africa, drawing on working models from Australia, the United States and the United Kingdom. A revolving land fund involves the purchase of conservation worthy land and on-selling (possibly donating where appropriate) to private individuals, government or conservation agencies, with restrictions in the title deed that guarantee the conservation of the land. Contract agreements and biodiversity stewardship programmes would play a central role in the implementation of a revolving land fund. Although some technical and legal obstacles to the establishment of such a fund still exist, several of these are being addressed as part of the biodiversity fiscal reform initiative discussed below.
- **Payments for ecosystem services**, such as catchment management fees where protected areas are contributing directly to catchment management and water supply.

Options for biodiversity-related fiscal reform have been explored as part of the broader Environmental Fiscal Reform initiative of National Treasury, and are likely to play a significant role in enabling protected area expansion through contract agreements and through reducing transaction costs of land acquisition for protected area expansion.

Following discussions between DEAT and National Treasury, the Revenue Laws Amendment

New fiscal incentives for landowners who have entered into contract agreements, effective from March 2009, are likely to provide a significant boost to protected area expansion. The purpose of these incentives is not to hand money out to landowners, but rather to remove prohibitive costs when landowners are engaged in conserving biodiversity for national benefit.

Further innovative financial mechanisms that should be piloted include a revolving land fund, which could be piloted by a public benefit organisation in one biome or region initially, and payments for ecosystem services in cases where protected areas contribute to, for example, catchment management and water supply.

Act (Act 60 of 2008) allows for deductions from taxable income of the maintenance costs of protected areas and the capital costs of nature reserves and national parks, for landowners who have entered into a contract agreement. These new income tax incentives for contractual protected areas, effective from March 2009, could provide a significant boost to protected area expansion.

The main purpose of biodiversity-related fiscal reform is not to hand money out to landowners, but rather to remove prohibitive costs when landowners are engaged in conserving biodiversity for national benefit. The biodiversity fiscal reform initiative is exploring the possibility of putting the following incentives in place in addition to those contained in the recent Revenue Laws Amendment Act:

- Reducing the transaction costs associated with land acquisition for protected areas, for example by exempting these transactions from transfer duty, estate duty (should the land be passed on to the state or a public benefit organisation), VAT and capital gains tax (should the land be sold to anyone willing to adopt the restrictions, management implications and status as a protected area), and donations tax (if donated to a public benefit organisation for the purposes of declaring a protected area).
- Removing perverse incentives in municipal property rates, which actively discourage conservation in some instances by discriminating against two forms of land use: ecotourism and game farming.
- Using Expanded Public Works Programme funding as an incentive to encourage landowners to enter into contract agreements, by assisting with high-cost aspects of biodiversity management such as clearing of invasive plants, fire control and wetland rehabilitation.

The effective implementation of biodiversity fiscal reform relies partly on having clear maps of areas where conservation efforts are considered to be in the national interest. The NPAES, together with other systematic biodiversity planning outputs such as the NSBA, provides these maps.

7. Who implements and monitors the NPAES?

CHAPTER SUMMARY

Protected area agencies, including provincial conservation authorities, SANParks, World Heritage Site Authorities and MCM, are the primary implementers of the NPAES. Each should develop an agency-specific protected area expansion implementation plan based on the NPAES targets and focus areas. The Protected Area CEOs Forum will ensure alignment of the efforts of the multiple agencies involved in protected area expansion, provide a forum for discussing challenges and sharing lessons, and track progress towards meeting protected area targets. Establishing and strengthening provincial biodiversity stewardship programmes is an institutional priority for provincial conservation authorities and for DEA.

Protected area agencies are the primary implementers of the NPAES. These include the provincial conservation authorities, South African National Parks (SANParks), World Heritage Site Authorities, and the Marine and Coastal Management Branch of DEA (MCM). Protected area agencies are supported in their implementation of the NPAES by a range of organisations including DEA, SANBI, National Treasury, provincial environment departments and conservation NGOs.

Each protected area agency should develop its own **agency-specific protected area expansion implementation plan** based on the protected area targets and focus areas developed in the NPAES.

A key recommendation of the NPAES is the revitalisation of the Protected Areas Forum, to be known as the **Protected Area CEOs Forum**. This is a national forum convened by DEA with representation from protected area agencies, SANBI, relevant national NGOs, and other organisations as required. The Protected Areas CEOs Forum will use the NPAES as its guiding framework, and will play a key role in coordinating and monitoring the implementation of the strategy. It will ensure that there is alignment of the efforts of the multiple agencies involved in protected area expansion, provide a forum for discussion on challenges and sharing of lessons, and track annual progress towards meeting protected area targets.

The NPAES will be **revised every five years**, led by DEA with technical assistance from SANBI and input from the Protected Areas CEOs Forum. The next revision, likely to be developed in 2013, will focus in particular on refining the approach in the marine, freshwater and estuarine environments.

> Protected area agencies should develop their own agency-specific protected area expansion implementation plans. The Protected Area CEOs Forum will play a key role in coordinating and monitoring the implementation of the NPAES and will provide a forum for discussion on challenges and sharing of lessons.

Institutional priorities for DEA to facilitate the implementation of the NPAES include:

- Revitalising and convening the Protected Areas CEOs Forum.
- Increased support for the establishment and implementation of provincial biodiversity stewardship programmes. This includes the need for strategic national support for provinces in this regard.
- Engaging systematically with relevant national departments to take forward the process of declaring public land and state land as protected areas. This involves first identifying public and state land in focus areas for protected area expansion, and identifying the departments involved.
- Continuing to engage actively in the Environmental Fiscal Reform process with National Treasury.
- Strengthening capacity to declare and manage offshore marine protected areas. This includes exploring mechanisms to give effect to the declaration of offshore marine protected areas, which may involve curtailing existing rights such as mining and fishing rights.
- Developing high-level co-operative governance arrangements between DEA and the Department of Mineral Resources, including addressing mining rights in marine protected areas.
- Selected revisions to strengthen the legal framework (see Chapter 9).

Institutional priorities for protected area agencies to take forward the implementation of the NPAES include:

- Developing agency-specific protected area expansion implementation plans, as discussed above.
- For provincial conservation authorities, proceeding with the development of provincial spatial biodiversity plans using the systematic biodiversity planning approach (in provinces where these do not already exist).
- Developing or strengthening provincial biodiversity stewardship programmes. These programmes should deal with the full range of biodiversity stewardship options, from informal through to formal contractual protected areas. Each agency should have a well-developed incentive or assistance package for contractual protected areas, over and above nationally applicable income tax incentives and exclusion from municipal property rates. Implementation of biodiversity stewardship programmes requires protected area agencies to strengthen legal capacity to negotiate and conclude contract agreements with a range of landowners and land users.

Institutional priorities for SANBI to support the implementation of the NPAES include:

- Ongoing technical advice on implementation of the NPAES.
- Monitoring the achievement of protected area targets.
- Facilitating the filling of key information and research gaps (see Chapter 8).

8. Information gaps and research priorities

CHAPTER SUMMARY

Key information gaps for the NPAES include an accurate spatial layer of existing protected areas; maps and classifications of marine ecosystems and habitats; a complete national wetlands map; and a national spatial data layer on land ownership and tenure. Research priorities include further exploration of the role of protected areas in supporting ecosystem-based adaptation to climate change; ecologically meaningful biodiversity thresholds for aquatic ecosystems; innovative ways to consider land price and opportunity costs in the identification of priority areas for protected area expansion; past and present trends in the funding of protected area expansion and likely costs of different mechanisms for protected area expansion into the future; the relative income and job creation potential of regular agriculture compared with protected areas and ecotourism; and research to support and evaluate pilot projects in which biodiversity stewardship agreements are used to support land reform and rural development.

Several information gaps and research needs have been identified in the development of the NPAES. The most urgent **information gaps** are:

- Updating and improving spatial information on the distribution of protected areas, linked to the Protected Area Register. This includes verifying protected area boundaries, ensuring that all protected areas are mapped and that all mapped protected areas have been declared. It is a complex task that involves searching through deeds records. Insufficient resources are currently allocated to this task, given the fundamental importance of an accurate spatial layer of protected areas.
- Improving spatial information on the distribution of conservation areas.
- Mapping and classification of marine ecosystems and habitats, especially vulnerable marine habitats such as reefs, sponge beds and kelp forests.
- Mapping marine ecological processes, for example spawning and nursery grounds and foraging areas for marine species.
- Completing the national wetland data layer and wetland classification.
- Developing a national spatial data layer on land ownership and tenure.
- Ensuring that accurate, up-to-date National Land Cover data are available. This is vital for both the terrestrial and freshwater environments and is required for several projects, not only the NPAES.
- Mapping pressures in the marine environment, including mining (diamonds, oil and gas), fishing, and non-consumptive use rights including tourism.

- Assessment of protected area effectiveness on an ongoing basis using appropriate tools.

Significant **research priorities** related to the NPAES include:

- Further exploration of the role of protected areas in supporting ecosystem-based adaptation to climate change.
- Research to support marine habitat mapping and classification.
- Research on ecologically meaningful biodiversity thresholds for marine, estuarine and freshwater ecosystems.
- Methods to integrate terrestrial, freshwater, estuarine and marine spatial planning to identify integrated priorities for protected area expansion.
- Innovative ways to consider land price and opportunity costs in the identification of priority areas for protected area expansion.
- Research on past and present trends in the funding of protected area expansion in South Africa, and on likely costs of different mechanisms for protected area expansion into the future.
- Research on the relative income and job creation potential of regular agriculture compared with protected areas and ecotourism (see section on the socio-economic role of protected areas in Chapter 2).
- Research to support and evaluate pilot projects in which biodiversity stewardship agreements are used to support land reform and rural development.
- Research on innovative financial and non-financial incentives and mechanisms for securing contract agreements on private and communal land.

SANBI has a key role to play in co-ordinating and facilitating the filling of these information gaps and research needs.

9. Some issues related to protected area legislation

The Protected Areas Act is the central piece of legislation for the establishment and management of the protected area network. However, other legislation is also relevant, including the World Heritage Convention Act (Act 49 of 1999) for world heritage sites, the Marine Living Resources Act for marine protected areas, the National Forests Act (Act 84 of 1998) for protected forests, and the Mountain Catchment Areas Act (Act 63 of 1970). In addition, several provinces have their own provincial legislation that deals with protected areas.

Several issues in relation to protected area legislation have been raised in the development of the NPAES. These include:

- All protected area agencies should use the protected area categories provided by the Protected Areas Act for land-based protected areas, and all land-based protected areas should be allocated to one of the categories in the Act (special nature reserve, national park, nature reserve, protected environment). It is highly recommended that provincial conservation authorities align their protected area categories with those in the Protected Areas Act.
- Provincial protected area legislation should not duplicate provisions in the Protected Areas Act but should rather focus on additional detailed issues that cannot be dealt with sensibly in national legislation. Provinces should ideally use the declaration provisions in the Protected Areas Act.
- There is a need to clarify whether additional regulations are required in terms of the Protected Areas Act, for example on the protected area declaration process and on matters related to contract agreements, or whether there is simply a need to develop and strengthen administrative processes to give effect to the legislation. This is particularly important in light of the pending implementation of new fiscal incentives for contract protected areas contained in the Revenue Laws Amendment Act (Act 60 of 2008) (see Chapter 6).
- There is a need to clarify whether amendments are required to the deeming provisions in Section 12 of the Protected Areas Act, especially in relation to private nature reserves declared in terms of pre-1994 provincial ordinances.
- There is a need to develop consensus on the status of mountain catchment areas. These were declared in terms of the Mountain Catchment Areas Act, which was forestry legislation at that stage falling under the department of environmental affairs. There is no consensus on the administration of the Mountain Catchment Areas Act and the responsible regulating authority for mountain catchment areas. This is an important matter to resolve, given the significant contribution that mountain catchment areas make to protected area targets and the vital role they play in providing ecosystem services.
- Norms and standards for management plans for protected areas should recognise the varying levels of capacity in protected area management authorities, and should not uniformly require a high degree of complexity.

Marine protected areas are declared in terms of the Marine Living Resources Act, and recognised by the Protected Areas Act. They are regulated by both the Marine Living Resources Act and the Protected Areas Act. The Marine Living Resources Act prevails if there is a conflict over marine living resources. The Protected Areas Act prevails with respect to some protected area functions but clearly not the control of fishing activities, or the prohibition on activities that may impact negatively on a marine protected area. There is some debate in the marine community about whether legal revisions are required to clarify the application of the Marine Living Resources Act and the Protected Areas Act with respect to marine protected areas. There is a clear consensus that establishment of marine protected areas should not be separated from fisheries management and that marine protected areas should never be entirely removed from the Marine Living Resources Act. The issues involved are complex and require careful consideration and legal advice.

The National Freshwater Ecosystem Priority Areas project, currently under way, will explore legal and institutional mechanisms for implementing freshwater conservation areas. This will include potential links between the Biodiversity Act and mechanisms provided by the National Water Act (Act 36 of 1998), the National Water Resource Strategy and the National Water Resource Classification System.

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South Africa's first National Protected Area Expansion Strategy deals with both land-based and marine protected areas. It highlights the role played by protected areas in biodiversity conservation and ecological sustainability, adaptation to climate change, land reform and rural livelihoods, and socio-economic development. The Strategy sets ecosystem-specific targets for protected area expansion, identifies important geographic areas for protected area expansion using systematic biodiversity planning techniques, and makes recommendations about mechanisms for protected area expansion. It provides a common set of targets and spatial priorities to guide efforts and enable co-ordination among the many role players involved in expanding and consolidating South Africa's protected area network.

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